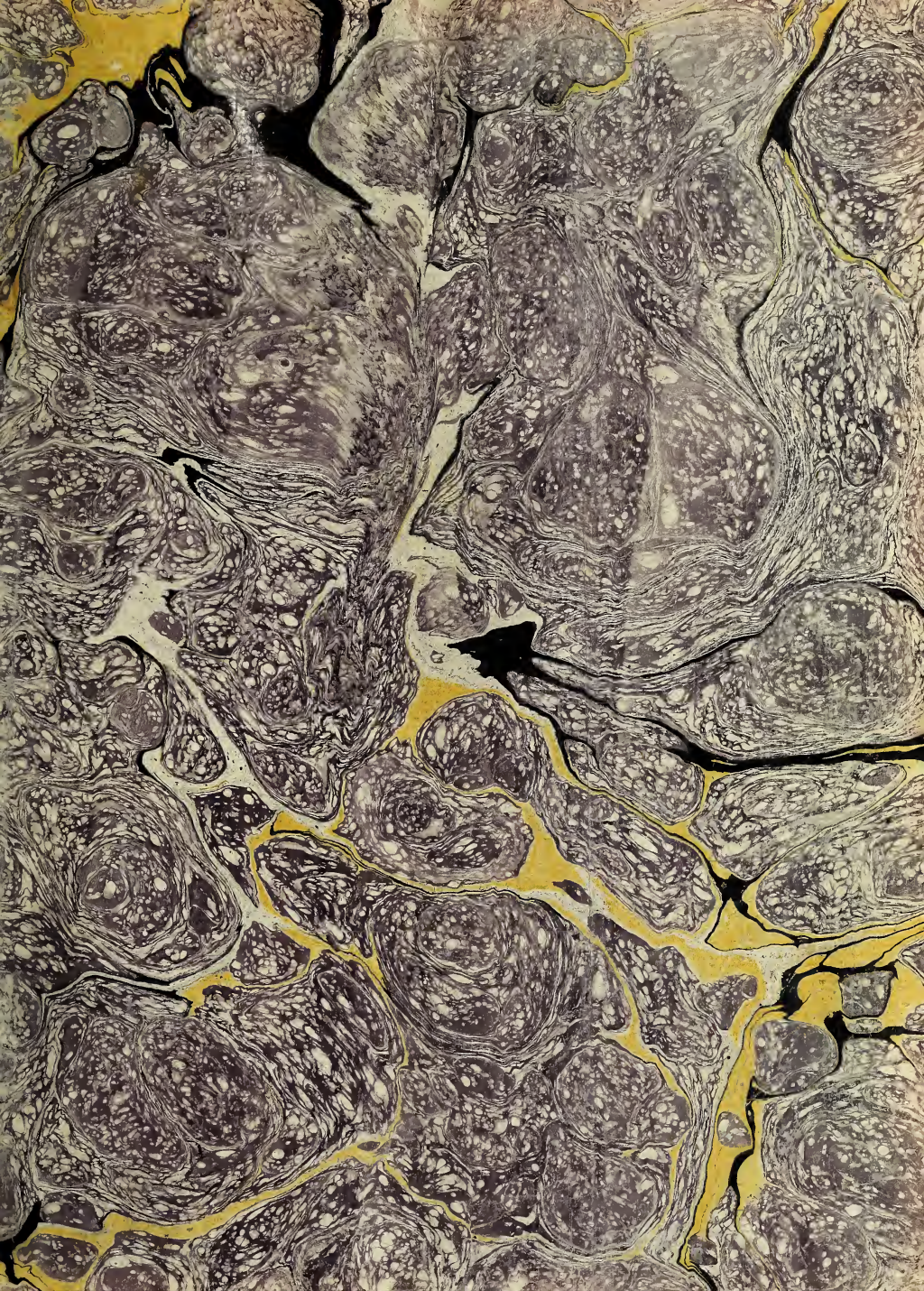






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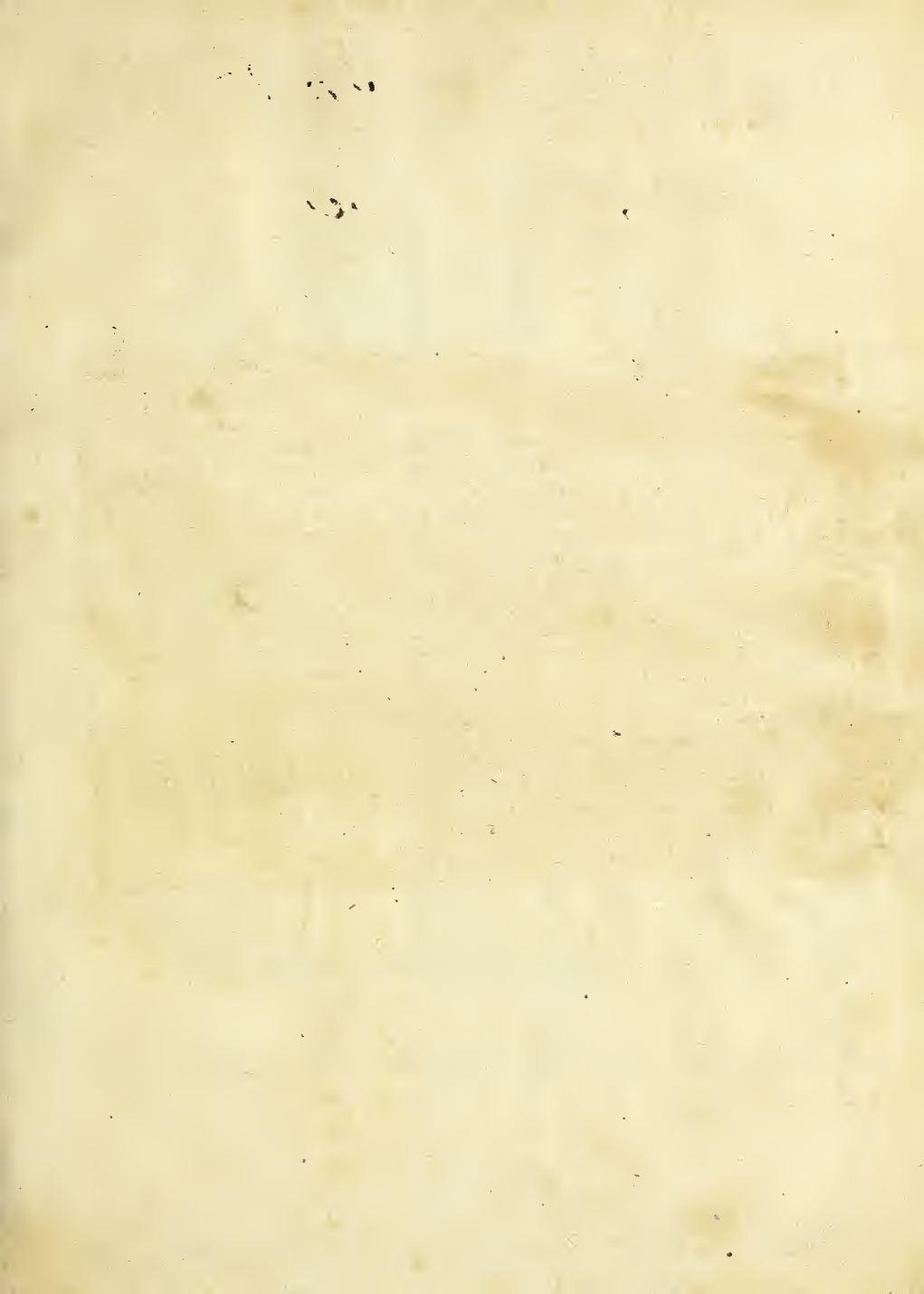
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Edition limited to 150 copies

M. Thew Dora Johnson



Johannes Godartius

O F

INSECTS.

Done into English, and Methodized, with
the Addition of Notes.

given by the author.

The Figures Etched upon Copper, by Mr. F. Pl.

T O R K.

Printed by John White, for M. L. 1682.

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To the Reader.

I Am not satisfied, that ever Goedartius intended to publish these Papers: or that He aimed at any thing more, then to please and gratifie his Fancy, and the excellent skill he had in Limning. And this appeares from the almost totall neglect of descriptions, which he had sufficient oppertunity, to have well performed; and the many references to the Colours in his Designs, which Calcography, or Printing could not represent; besides the tumultuous order, we have them first published in, after his Death: above all, the little advancement he seemes to have made, in his Skill, in the nature of Insects, after 40. Yeares (as he says himselſe) daily conversing with them: so that he seemes rather, to have diverted with them, then to have given himselſe the trouble of well understanding them.

And yet after all this, you will find him every where very just, and true in his Observations: but in many places very short, and hardly Intelligible.

Again, as he most industriously ſed them, and

To the Reader.

observed their Changes ; so he committed little or nothing to Writing or Designe, but what succeeded with him, and (as he understood it) had its right Change : Which is more, than any man ever did before him ; So that we need not admire, that so long, and pertinations an Industry produced so few Historys : For he Designed not all, that came to hand, but such only, as it was his good fortune to Feed, and bring up to Change.

And yet in these few Historys, you will have something of all the severall Genus's of Insects, that are in Nature.

He left his Papers in Dutch, which were at severall times, and that by divers hands, put forth in Latin : His Latin Interpreters have added Comments ; indeed ; but were Men wholly ignorant in Naturall History ; and their Comments are meere Raplodies, and altogether impertinent to the Explication of any one History of Godartius : As he, who shall attentively consider them, will plainly find : wherefore in this our Translation ; I have omitted them, and have Printed the Authors words only, and have here and there used the freedom of animadverting, upon what is not agreeable to my owne experience in these matters : besids I have Methodised the Historys, according to the Severall natures of the Insects they treat about ; and ;
where

To the Reader.

(where I could understand him) I have explained many things, that might be doubted of: And those who enjoy a sutable leasure may hereby be put in a ready way, to pursue the History of these long neglected Animals.

Also I have taken great care of the Designes, in transferring them upon Copper Plates; which I dare promise are Exquisitly performed, by the best of our English Artists: which was my expence; and which the Book-sellers were not willing to Reimburse me; so that this Impression consists but of a 150. Coppys, which were intended only for the curious. And upon this occasion I must needs say, that Naturall History is much injured, through the little incouragement, which is given to the Artist, whose Noble performances can never be enough rewarded; being not only necessary, but the very beauty, and life of this kind of learning.

If the Reader shall yet desire to be informed, why the Comments go no farther, then the greater part of the work only; let him know, that the Translation lay by me unfinished, and in the first draught for above Seven Years, and had so done long enough, had not my very good Friend Mr. T. K. of Cowkreig, very Obligingly undertaken to Transcribe and perfect it. So that the humour of Comment-
ing

To the Reader.

ing being past me, and the notions I once had of these things, being lesse fresh in my memory, I had little leisure to instruct my selfe againe, but suffered it to go in that particular, as he found it.

M. L.

Section I.

*Of Butterflies, sitting with erect Wings:
all whose Chrysolis are Angular: of which
there are VIII. Species.*

Number. 1.

*Godart.
Part 1.
Tab. 1.*



THE Catterpillar, N. 1. is prickle Haired; it hath its birth from an Egg, which the Butterfly (N. 1.) having eyes in its Wings, like those in Peacocks feathers, doth lye upon Netles.

This Cattarpiller I took up the 14 day of May, 1635. And I fed it with the Leaves of Netles, untill the 11. of June, of the same Year. Then it composed it selfe for change, with its head hanging downwards, as you may see in the Table. It remained in this forme 19 dayes. When a most elegant Butterfly came forth.

At the first coming forth of the Butterfly, its wings were like wet Paper; Off of which fell certain watery drops: But that, which did seem to me worthy Observation, they became in halfe an houre dry, expanded, and fit for flight.

This Butterfly feeds on sweet things, as Sugar, and the Honey of flowers: Also it is mainly delighted in rotten fruits, for which they fight among them selves.

In winter time they hide them selves within the Chimnies of poor Cottages, from whence I have forc't them with a good blazing fire.

Also they are found lying hid in hollow Trees.

It is well Observed by our Author that this Caterpillar, hath its beginning from the Egg of such a Butterfly ; and so probably have all Caterpillars whatsoever their beginning from the Eggs of their respective Butterflies. The Butterfly is the Mother Insect in perfection, and the Caterpillar, its Aurelia, or Chrysalis are but certain Disguises for a time, wherewith one and the same Animal is by nature invested for divers ends. viz, that of the Caterpillar to eat such and such food ; This of the Aurelia to perfect and barden its limbs.

Number. 2.

Godar.

Part 1.

Tab. 12.

Although our Fingers suffer and are stung by Nettles, yet the Caterpillar marked *N. 2.* delightes to feed on them : Neither doth it make ready for the change, or obtaine from food, whilst this Plant flourishes.

It began to change the 23. of June, and the 9th. of July came forth the Butterfly marked with beautifull colours, *Figured in N. 2.*

These Butterflies are to be found all Winter in Stables, where Beasts stand.

These Caterpillars are exceeding Voracious.

These

Here is wanting the Figure of the Chrysolis. We have noted in the foregoing Number, the use of the disguises of Butterflies: and I shall here Observe, that Caterpillers feed of course and barsh food, such as the substance of the leaves of Plants; whereas the Butterflies feed of the Honey of Flowers, and liquid meats. This is contrary to what is naturall in sanguineous and more perfect Animals; who in the Embryo feed of a prepared Chyle, but after birth have a yet more courser food to nourish them: And yet more course as they grow older, and to maturity.

Number. 3.

G.P. 1.
Tab. 77.

The nourishment of the Catterpillar N. 3. are the leaves of the *Elme*.

When the time of the change groes near, they betake themselves to Houses, and fix their hinder parts to a wall, hanging down with their heads, that they may more easily come forth of their shell or *chrysalis*, when the time of change is compleated.

Before the Catterpillar changes its shape for that of a *chrysalis*, and puts off its old skin, it seems to be very much troubled, turneth, shaking, and tossing its body every way, and trembling as if it had an Ague. At length rising, and falling often with his body it conducts its body into a circle, upon which it swells so, that the skin cracks all the length, and so by little and little it falls off, a new skin growing underneath. And at that time they rest a while.

This is very notable in these Catterpillars, that where the back of the Catterpillar was, there are the belly and feet of that Animal it's changed into ; and the contrary, where the belly and feet of the Catterpillar were, there now the back of that Animal is, which was produced by the change of the Catterpillar. And this change is produced in a very short time ; so that it may distinctly be seen and observed : For as soon as the old skin is layed aside, this Transfiguration manifestly appears.

The Catterpillar of *Number 3.* Began to change the 21st. of *June* and the 30th. day of the same Month it was changed into a very fair Butterfly, which I have also exactly delineated *Number, 2.*

Immediately after the change, its wings were like moist Paper, but in halfe a quarter of an hower they dried, were expended and made fit for Flight.

Afterwards the Butterfly let fall from his Taile four dropps of blood ; and after halfe an hower one drop of cleer liquor, like Fountain Water.

It lived a Butterfly 19 dayes without food.

Another Catterpillar of the same *Species* composed it selfe for Change the 13th. of *July*, and that change being come to perfection. there broke out of the Back, (of the Catterpillar) 82 Flyes, as in *Number 3.* So that out of one and the same *Species* of Catterpillars, a Butter fly is produced, and 82 Flyes.

Note, That I believe the Author was mistaken in his Observation of the Back of the Catterpillar being the Belly of Butterfly, and the *Chrisolis* might well enough I conceive turn its body within a dry, and loose skin, in the act of throughing it off, and cause this mistake ; especially, when it was so much troubled and concerned in the cracking of it, as is noted by our Author.

2. Concerning the Catterpillars fixing his Body to a Wall, it is to be Noted, that this is done by a single thred cros the midle, thus, (for I have more then once actually seen it in doing) This is done, before it appears in the disguise of an angular *chrysolis*. The Catterpillar doubles its head backwards, and touching the place, where it would suspend it selfe, it fixes a thred on both sides its body, drawing it a crosse, and then reducing its head and laying it selfe in a pendulous posture, it tosses it selfe and cracks the skin of the Catterpillar, which flying off, it appears a *chrysolis*, hanging as is described.

3. I have my selfe often Observed that Red liquor fall from the Butterfly *Number*, 2. And also an equivalent one, though not Red, from many flies hatching from *chrysalises* : and 'tis by the means of this liquor, they swell their Bodies and crack their Shells of their respective *chrysalises*. A sprinkling also of this liquor makes their wings so moist, when they first come forth. See in the Life of *Peirescius* of the Reining of Blood, referred hither.

4. the 82 Flies here mentioned were the brood of the *Ichneumon* Fly, conveyed into the body of the Catterpillar. I confess I am not yet acquainted with the manner of the conveying them; but I am perswaded that it is done by the *Ichneumon* parent. This I can affirm, that these bold Animals do frequently lay their Yongs in the very Egg-cake of Spiders. Again I have seen them perforating the excrescencies of trees with a tongue from their mouth, as with a winble; without doubt either to destroy and feed on the Maggot within the excrescence; or else to impregnate them with their owne kind. More I have spoken to this matter in one of the monthly Transactions of Mr. Oldenburgh: However these Flies most certainly are a *By-birth* only. It is farther remarkable in this *Number*, that these 82 Flies did break forth of the *chrysalis*, which also is unusuall.

Number. 4.

G. P. I.
Tab. 26.

Some times I have observed the Changes of Insects to be made into more beautifull Animals ; then I expected ; as in the Catterpillar N. 4.

I fed him with *Elme* leaves, in which he delighted. He hath a very deformed and ugly head, whereas in in most other Catterpillers the head shineth like a Looking Glass.

He purgeth himselfe and beginneth to change into the forme N. 4. The 7th of *June*, and the 20th of the same Month came forth a most beautifull Butterfly, marked with most elegant colours.

These Butterflies continue alive all Winter, unlesse other little Animals devour them, or Spiders strangle them in their webs.

Our Author hath diligently observed all alonge, that Catterpillars exactly Purge themselves of all their excrements before they change, and are in the disguise of Chrysalises. We have said that the use of the disguise of a Catterpillar is, to eat a different Food, and that which the Butterfly cannot eat : And therefore it is but reasonable, that the Catterpillar should quite and cleane empty it selfe of all the old food, when it is about to become a new feeder. I am moreover conceited, that the Change of a Catterpillar is not superficial only, but goes deeper yet, and that the intestines are in some sort changed also, as well as the Organes of the mouth. The inside of the Guts being indeed an outside too in all Animals.

Number. 5.

I gave this Catterpillar N. 5. Many plants to eat but he refused them all: At length it came into my minde, that he might be delighted with Netles, which when I had brought to him, he to my great admiration rubd his Head against them, and shewed signes of gladness, and eat them greedily.

After he had been fed some time with Netles, he composd himselfe for change October, 3. In the forme expressed N. 3. Under a Glass, to which he fixed himselfe with his Head downwards.

If you touched the *Chrysalys*, it moued it selfe so strongly as made the Glasse ring like a Bell.

Out of this change came the 1st. of December, a very faire Butterfly, Peacock-like Eyed.

The Butterfly lived 40 Dayes without food, and dyed, for I knew not what to feed him with.

This Catterpillar says 'our Author', refused to eat of many sorts of plants offered him, and would feed of none but Netles: I add, and he would have undoubtedly starved first: This is not an effect of the different make of the Organ of their mouthes, (as above said betwixt the feeding of a Catterpillar and a Butterfly) but verily the delicatenss of the Palate and taste: which perhaps might be improved to good purpose in discovering the vertue of Plants.

I am perswaded there is no better way to know what kind of wood is best, for Sheathing of Ships, than to essay certain polished peeces thereof like Tallies tyed to a Buoy in the Waters and streames much infested by the Worme. For that sort of wood, which they shall refuse, is in all reason to be chosen for the use desired. And the Indies are stored with greater variety of Timber, then Europe, so that it would be very probable there may be some found, which that kind of River Worme will absolutely refuse to Eat.

G. P. 3.
Tab. 4.

Number. 6.

The Catterpillar marked *N. 6.* Leads a peacefull Life : But is exceeding fearfull, it is moreover hairy, and very sensible,

It feeds on the leaves of *Carduus Benidictus* the softer part of which leaves they greedily eat; but the more sticky and harde nerves they do not touch.

About evening they make themselves Webbes in which they defend themselves against the cold of the night. They are of a Black colour, and have sharpe prickles mixt with yellow.

This Catterpillar began to change the 19th. of July 1665. The change was of a pretty Figure, and as it were GUILT.

Out of the *Chrysalis* came the 7th. of August, a most elegant Butterfly and marked with divers colours. It lived with out Food, untill the 11th. of the same month.

The middle state or disguise of a Butterfly is called by the Greeks Chrysalis, or a thing gailt, as the word importeth: The Latin hath left us no name, that I know off: we have Translated it Aurelia. The Latines however call the Caterpillar Eruca: which is a word (as I guess from a place in Vitruvius) which signifies in the old Tuscan Language Viride æris, and thence borrowed to signifie a Caterpillar; for some Caterpillars there are, which I have seen in Languedoc feeding on a certain Common Tithymal, very notably painted with a sea green Colour, or Blew. So that as the gilding of some few Chrysalises, gave a denomination to all; in like manner the Blew Colour of some one Caterpillar gave the Name to all the rest. As for the Gilding it selfe, I take it to be nothing else, but the Scum of an evaporated juice between the Skin of the Caterpillar, and the shell of the Chrysalis, which last it covers.

Number. 7.

G.P.I.
Tab. II.

Few Caterpillars love Cabbage, and yet the Caterpillars which are designed in the 7th. Table: eat white Cabbage, but will not touch the Red Cabbage. Cold and moist weather is a very great enemy to them and soon destroys them, and they wither to nothing, but skin.

They have a double time of change; if that happen in Summer, it is at an end soone, but if it begin in Autumne, it lasts untill the following Summer; I have experienc'd both changes.

One of the Caterpillars of the 7th. Table changed the First of July, and the 12th. of August, the white
C Butterfly

Butterfly came forth, represented in this Table; Another of the same Species, changed the 17th. of *December* and remained a *Chrysalys*, till the 15th. of *May* the Year following; when a Butterfly came forth; the very same with the former.

But another Year it happened, that I observed in the same Catterpillars a wonderfull thing, I tooke a certain number of these Catterpillars, at the same time: I fed them untill they of their own accord left their meat, and betook themselves to rest and for generation: after they had lain still 4 dayes, and did not move, I saw break forth of the Skins of each Catterpillar, on both sides the Animall 40. in some, 50. in some 52 little Wormes, which Wormes as soon as borne, made themselves little Netts: (or Baggs) of yellow Silk, beginning from the Taile to the Head, and shut themselves up in those Netts in those Baggs they defend themselves from the cold of Winter.

The Catterpillar (out of whose Skin I said those Worms came) knit all their little Netts together on a bunch that they might not be scattered, but that they might be turned into Flies in Summer, in one place, and at once. The Catterpillar notwithstanding all these wounds, out of which 40, or 50 Wormes did break forth, lived without Food in my Clofset from the 24th. of *September*, untill the 28th. of the same Month. the 19th. of *October* the above described Worms turned into so many little Flies, and all of them dyed within 6 Dayes.

Another Catterpillar of the same Species after its Change, and that it had lain in it 14 Dayes, 2 Worms broke out of the forehead of it, and those two Wormes, in my sight in the space of an hour and a halfe, were changed into Eggs of an Amber colour: and 13 Dayes after that, out of each Egge came a middle sized Fly.

These things I have had the experience of, and have Observed them, not without admiration, because it seems

seems besides, if not against the usuall course of Nature, that from one and the same Species of Animals, an Offspring of different species shou'd be gendred, and that one and the same Animal shou'd procreate after divers manners, which thing yet is made manifest in these Catterpillers, as I have in few Words declared.

[A double time of Change] The reason may be, for that those Catterpillars, as is Observed by our Author, are very tender; so that they which Change not, till the cold weather come on, continue in the middle state or disguise, till the Spring following: otherwise shou'd they then Change into Butterflies and lay their Eggs, the Brood would perish with the cold: Others there are to my knowledge, that are constantly hatch'd Catterpillars the latter end of Summer, and not having time and Food to bring them up to a full growth, in order to their Change, do club for a web amongst themselves, and continue a very small Fry all Winter, and when the leaves begin to break forth, they again come forth, feed a new, grow great ones, and Change: as the common Hedge Catterpillar, &c.

2. The numerous Rase are Ichneumon's, the two others are a sort of Flesh-fly: Both these I say are By-births, and not at all generated by the Catterpillar, but by their respective Parents: the Catterpillar which bore them, serving only as Food to them, not a Mother. It's to be Observed that the Flesh-Flyes, did feed upon the very substance of the Catterpillar, or Chrysalis, as they would upon Carrion. That the Ichneumons did not destroy the Mother, and love not corrupt meat, possibly the very food of the Catterpillar digested by her, was their nourish-

ment, and not her bowels, who many days survived the strange eruption of that brood; I have opened many Caterpillars of that very Species, in which I have found of these worms, but how and when they are conveyed into their Bodies, I do not yet understand.

3. That is very curious and particular, if there be no mistake in the thing, that our Author says: The Caterpillar her selfe knit all the little Nests into one bunch, as though she acknowledged this Brood to be her owne: and yet this is no prooffe they are so; For we see in Birds, the like instance, the little Bird called the Hedg Sparrow, will carefully and most affectionately, bring up, as well as Hatch, the young Cuck-OW.

Gadert.
Part 1.
Tab. 27.

Number. 8.

When Savoy Cabbages and Colliflow'rs begin to knit, often are seen about them certain Butterflies which lay their Eggs upon those Plants, which Eggs by the heat of the Sun, are Attracted and set in an upright Posture, and at length Caterpillars break forth of those Eggs and devour the Plants.

These Caterpillars easily endure the heat of the Sun, but not at all lasting Raines, which soone maketh them tabid and nothing but Skin.

The Caterpillar of this 8th. Table, purged it selfe and changed the 3^d. of August, and the 17th. of the same Month came forth the Butterfly here represented; This Butterfly is but slow and not nimble, though it be sometimes found to live over the winter and longer.

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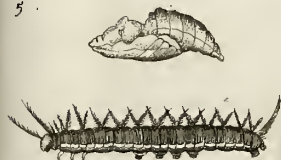
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4.



5.



6.



7.



8.



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I have verily Observed the Butterfly in the very act of laying her Eggs upon a cabbidge leafe; which is thus done, the Butterfly sits upon the edge of the leafe, and bending her taile under the leafe, she fixes (by touching the leafe with the point of her taile) one Egge, and then another, and so a 3^d. untill she hath layd as many as she list ; But all these Eggs are in that moment fixed with the small end upwards, and not laid sidewayes, and afterward turned upwards, by the heat of the Sun, as our Author seems to say.

Section. II.

OF Butterflies sitting with flat Wings, whose Caterpillars want the middle Leggs, and from there manner of going in Loops, are by some called *Geometre*.

Number. 9.

G. P. 17.
Tab. 31.

The Caterpillar of the 9th. Table comes of Seed or Eggs, hard to be found out or met with, I at length with much dilligence Observed them, laid upon certain leaves, and covered with haire and downe, Animall like, and so are preserved safe from cold, opening those leaves I found a Green seed, or Eggs.

These Caterpillars feed on *Goosebury-leaves*, also of Red and White *Curran-berries*.

They are wont to change about the end of June, as the 22. The change is elegant, whose Figure you have

in this Table. It remained in the chanc to the 13th. of July, on which day came forth a small white Butterfly with black spots.

If you take the *Moth* in your hands, or suffer it to fall, it seems dead a while and moves not,

Here is a great mistake in this History, of Catterpillars laying of Eggs, and therefore I have amended it in the very Text, beliving it an escape of the Latin Translation.

This Catterpillar feeds not only upon the leaves, but on the very green Fruit of the Apricock, as I have Observed.

It was from the change of one of these Catterpillars that I imagined I had a small green Beetle, but more of this in another place.

G.P. 2.
Tab. 34.

Number. 10.

The Catterpillar of the 10th. Table: was put into my hands by a couple of friends, the 14th. day of October, with intreaty that I would observe its way of living and change, I undertook to do what lay in my power, I knew not what it fed on, and therefore I took much paines to find it out, to that end I put before it leaves of divers Herbs and other things, which I knew Catterpillars to feed off, but it would not so much as taste of any of them. Then from its colour, which was not much unlike the leaves of Elder, I began to suspect, that those leaves might not be ungratefull to it, being

by experience taught, that some *Catterpillars*, are coloured some what like the Herbs and leaves they are nourished with : I gave it *Elder* leaves to eat, [it devoured those willingly as I thought, but yet once a day only.

At evening after Sunſet, when it began to be darke, it eat halfe an hour together, when it once fell on, and being full it ſtretched it ſelfe right out, and in that poſture it looked like a ſtick out of a Faggot, for I cou'd ſee no leggs at firſt look, and yet was not without them, wherefore I have drawn the feet of the forepart of the Body, in that part alſo was a riſing bunch ; by the halfe of which it ſo faſtned it ſelfe, ſucking continually like a *Leech*, that it cou'd ſcarce be plucked away, and wou'd rather ſuffer it ſelfe to be plucked in pieces, then be ſeparated from what it ſtuck to.

Alſo the hinder part of his body was very tenacious: it represents a *Golpſmiths Forcibles*, with the which he is wont to take a *Crucible* out of the fire, he ſhutting his hinder, feet as thoſe *Forcibles* are to be ſhut, and in that poſture if you ſhake him, and tumble him never ſo much, he will reſt and not move, like a dead thing ; ſometimes a whole day together, but when he crept forward, he took long ſtrides, ſtretching out himſelfe at full length right forwards, drawing up the hinder part of his body to his fore part, like a Loop, or the Buckle of a Belt, and thus he walked.

The 25th of *October*, he put off a Skin, as many other *Catterpillars* uſe to doe, when they are about to change, and hung with his head downwards, from ſix a Clock in the morning, untill eight at night, at which time he was alwayes wont to creep abroad, he eat at nights and ſlept in the day time.

Now when the *Elder* leaves were fallen, and being dry, had loſt their former taſte and virtue, he reſuſed to eat any more, the 19th of *November*.

he faſted all Winter, doing nothing elſe but ſhifting his place

place every Night 3 one Night hanging with his head downewards, and another with it upwards, alwayes his body at its full stretch and length, and thus he passed the time away. All the time I had him by me I could never perceive any signes of life in him o'th day time, except that Day when he was put into my Hands, and those small Signes that were, I Observed by the benefit of a *Light*.

The 26th. of *March*, the Year following, I set before him the Buds of *Elder*, if now perchance he had a mind to eat, after so long fasting, but he would not tast them. The second of *May*, I gave him the full grown leaves of *Elder*, and at length I found him eating of them.

But so it was, that 3 *Dayes* before he fell to eating againe, he had drawn a *Thred* along the sand, which I layed for him, out of the *Saliva* of his mouth, and that thred was a long one, and much small Sand stuck to it, like so many threded Beades, by the help of his Forfeet he drew this thred to his mouth againe, and swallowed the sand, as I guessed to change his sick stomach, as certain *Eels* swallow *Prickley* small Fish for their stomachs sake.

And that also was worth the noting in him, that he was grown a third part bigger in thickness and length, since he eat, then he was, when I first had him, that he also roled his body in the Sand, and tued him there, as oft as he eat.

The 16th. of *May*, he fastened the hinder parts of his body to the Glasse, which I kept him in, his head hanging downewards, and he clothed himselfe with leaves, and a Web woven by him round about his body, in the forme of a little Bag or Net: into which Bag, (changing) he put off his Skinn, and let go his hold from the Glasse, to which, with his hinder part of his body he held fast, he let himself fall with his whole body, and in this posture he betook himself to change.

The day after he had that forme, which is expressed
in

in that *Table* : the 24th. of *June*, came forth an unusuall and wonderfull *Butterfly*, of a Yellow Colour, golden haired, which (very much shaking its Body) dyed the 5th. of *July*.

It was well our Author lighted upon the leaves that these Catterpillers would feed on : though that was done by imagination, more then reall resemblance.

It seemes reasonable to me, that he who would effectually prevent the Worme eating of Ships, should well understand the History of what Insect it is, that infests them ; and particularly the manner of its feeding. Wormes, most certainly have Peculiar palats, as well, as the more perfect Animalls, and will rather die, than eat such and such an Herb, or Wood : So that the Wood that by experience, they shall be found, to refuse to eat : that is the Wood, which is the proper materiall to Sheath, or Plank Ships with. And this being so grand a Desideratum, it would be worth trying, all the numerous varietyes of Timber Trees which Europe, or the Indies afford, which might be easlie done by Tallies of them fastened to a Buoy, in the most dangerous Rivers, or Bays, as I have noted above.

Number. 11.

*God. P. 2.
Tab. 43.*

The *Catterpillar* of the 11th. *Table* eats *Pare tree-leaves*, but is most delighted with *Rose-tree leaves*, they are not very greedy, and eating by intervalls they lie quiet, and sometimes extend themselves, having fast hold of the leafe, with the hinder part of their body. Being full, they rest in the forme you see exprest in the *Table*: They care not much to change their place, and go not from

leafe to leafe, as is the way of many *Catterpillars*, they willingly leave not the leafe or twig, before they have devoured all : They are elegantly coloured, the upper part of their body being darke, the under yellowish, but not so faire after meat, as before ; because they are of a very thin skin, and the Green food, they take, is seen through, and doth obscure the various colours, which addorne them.

Before they betake themselves to Change, the upper part of their body often turns redish.

This *Catterpillar* fed by me some time, began its change the 19th. of *June*, in that very *Forme*, which you see him expressed in. The 27th. of *November* came forth a lesse beautifull *Butterfly*, marked with many black spots in the Back, like a *Marbled Book*, as the Fashion now is ; This lived a hungry life for 4 Dayes, I not knowing what to feed it with.

I had another of these *Catterpillars* ; out of the hinder part of whose Body, before he betook himself to change, 2 little worms crawled forth the 18th. of *May*, of a duskey colour ; within 2 Hours they took the forme of Eggs, coloured like the Mother *Catterpillar*. The 9th. of *June*, the same Yeare, came forth of these Eggs, two *Flyes*, which within two Dayes, shaking and trembling, died and about that time also dyed the *Catterpillar* it self. After that the *Catterpillar* had spawned those worms she dwined away, pined, and never eate more.

These 2 Wormes, I say, were the disguises of certain Ich-nemones, and not Flesh-Flyes, for the very reason, that the Catterpillar survived their eruption, Flyes feeding on Carrion or Putrified bodies.

Number. 12.

G. P. 1.
Tab. 35.

The *Catterpillar*, of the 12th. Table feeds on the leaves of the *Black-currant-bush*, it is of an other shape then the ordinary *Catterpillar*, which are wont to have feet in the middle of their Bodies; but this has them at the extremities, and are very strong with them, when they change place, and creep from bough to bough, they firmly lay hold of the bough with their feet, and lift up their body like a *Snake*, and so try for another place to remove to, they hold so fast by their feet, that you can scarce pluck them from the thing, they adhear to.

This *Catterpillar* changed (having first exactly purged its Body) the first of *Aprill*, and the 24th. of *July*, came forth the *Butterfly*, expressed in the 12th. Table: tender, and a short lived *Animal*.

Number. 13.

G. P. 3.
Tab. 5. K.

This green *Catterpillar*, of the 13th. Table, eats the Leaves of the *Elder-Tree*. When its full, it extends its Body forcibly the whole length, and in that posture rests untill the next day. As it creeps, it joynes its hinder parts to its fore-parts, like a *Loop*, and then extends it selfe forwards, and then gathers it selfe up againe, and so on to its journeyes end.

It changed the 6th. of *October*, 1663. And the first of *May*, the Year following, 1664. It appeared in the shape of a most beautifull *Butterfly* expressed in the 13th. Table, I chose the most *Elegant* of them to designe that by,

because there is some difference in such, as are bred of this *Catterpillar*. This *Butterfly* was very nimble, and of a swift flight.

Number. 14.

G.P. 2.
Tab. 21.

The *Catterpillar* of the 14th. Table, exprest to the life, are great Lovers of green Garden *Lettice*, but will not (like many other *Catterpillars*) touch the Plant withered.

This *Catterpillar* began its change the 8th. of *June*, in the *Forme* exprested.

About the beginning of *August*, came forth a *Butterfly*, hoary colour, having a long Stinge in his fore-head, or an extended *Ray*, which lived but one day fasting, I knew not what to feed him with.

But I have Observed this kind of *Butterfly* to fly about Flowers, dipping that long Sting, or Tongue into the flowers, and so to suck out the Honey, or sweet juice, not settling or lighting upon the Flower, but doing of it as they fly; for if they settled, their Legs were too short to suffer them to use their *Tongue*; and this I take to be the cause, of their constant taking their nourishment in flight, and not alighting, or settling upon the flower,

There is a sort of *Gnatts*, bred in Trees, which in like manner are armed with long Strings, and can use them sitting, because they have long Feet, especially in the hindmost feet, so that he can fasten his Sting where, and how he pleases; but the naturall short feet of these *Butterflies*, hinder their feeding, save when they are upon the Wing.

This

This Butterfly is an exceeding swift flyer, he is very frequent in July, in Gardens amongst Gilly-flowers and Pinks. I did once take a small Species, of them exceeding beautifull; in Morgans Garden in London: I ust to call them the Hawk-Flye, for their exceeding swiftnesse.

Our Author, in my opinion has well assigned the reason of their Feeding Flying, to the disproportion betwixt their Legs and Tongue, or Pipe.

Number. 15.

G. P. 3.
Tab. P.

The *Catterpillar* of the 15th. *Table*, runs swiftly ; for every stride is the whole length of his body, going like a paire of Compasses. It is found for the most part about the *Thlaspi* kind of Plants , which kind of Herbs it greedily devours : It feeds by Night only, and moves not by day ; and although you do disturb and molest it, yet it will keep it selfe quiet without any manifest motion.

It changed the 11th. of *August*, 1664. And the first of *September* it appeared again, in the shape of the *Butterfly*, expressed in the 7th. *Table*, of a rapid flight , which yet it wou'd not be brought to, but by the light of a Candel, or some such Artificall Light.

In Flying it vsed a strange motion of its Body , as though it was perpetually circumvolved, with its Head downwards, and in a Circle.

It Feeds by Night only :] These Animals, as well as others, have a naturall instinct, to preserve themselves, and feed only, when they are most secure, and the Insectivorous Birds at Ronst.

G. P. 2.
Tab. 16.

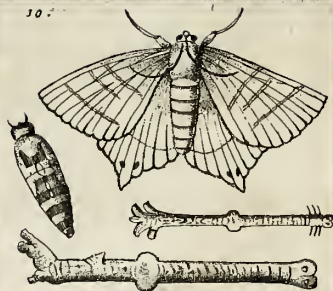
Number. 16.

The *Catterpillar* of the 16th. *Table*, eateth *Hyssop*, and is found chiefly about that Plant, when in flower, but if you touch the Plant, it falls to the ground, and thus hides it selfe.

After I had a long time fed this *Catterpillar*, with *Hyssop*, it changed the 7th. of *August*, and when it had been some dayes in that condition, Three Wormes broke out through the skin of it; which in a very short moment were changed into Three Eggs. And out of every one of these Eggs, the 8th. day of *September*, came forth a Fly, as I have exprest them exactly in the 16th. *Table*, the Fly lived not above three dayes.

These were Flesh-flies, and consequently the Chrysalis was Rotten, and this History not finished; because we have not the Butterflies, which in reason we ought to expect, the disguise declaring as much to us. I am at a losse how







how it comes to pass, that in our Northern parts of Europe, where such Plants as Hyffop, &c. Doe not naturally grow, there should be found Insects to feed on them; we must either say, that they came into our parts by degrees, that is the Plant being cultivated at first, not far off the place, where its Native Soile is, the Butterfly strayed, and found it out there, and so on; or, (which is most probable) this Catterpillar will feed of other Plants, as well as Hyffop, and so the Catterpillar is no Stranger to the Soyle, though the Plant be; This I say is more probable, then that the Butterfly and Plant shou'd both be Strangers, for I cannot think, that this or any Animall else is Spontaneously produced by the Plant, or any cause else whatsoever, but the Animall Parant.

Number. 17.

G. P. I.
Tab. 71.

The Catterpillar of the 17th. Table, is all green, like the Carran-tree leaves it feeds on: it Eats those leaves, beginning in the middle, where it greedily feeds, but touches not the outsides of the leaves, when full, they lift themselves up, and then extending themselves they rest; continuing in this posture three Hours, untill the meat be digested, then they excerne, what has been put over, and fall too againe; they never drink as many other Catterpillars do, that I cou'd observe, therefore must you feed them with fresh leaves constantly, if you wou'd know what they will come to. It purgeth its selfe from all its excrements (as is the custom of Catterpillars) and began its change, gathering some leaves I had given it, Glewing them together by a Slimy humour, (from its mouth) about its body.

This (Catterpillar) expressed in the Table, remained

ed without motion, from the 4.th of *June*- till the 5.th of *May*, the Year following, that is a 11 Months and a Day: at which time came forth a *Fly*, with a Black body, all but the upper part of the Taile *Yellow*. This as soon as it came to Light, rested a while, untill the aire had dryed and hardened it, and then it pruned its Wings and slicked its Body over, and prepared its selfe for Flight,

Our Country-people call these kinds of *Catterpillars*, *Surveyours* (*Geometre*) because of their Gate, which is like a Pole turned over and over, as when one measures Land.

This Fly, is one single pretty large Ichneumon, or Slender Waspe, and therefore this History, as well as the precedent, are imperfect; because these are but By Births and not the Butterflies, which ought to be expected, and of which these Catterpillars, and their Chrysalis are but the disguises.

Section.

Section. III.

Of *Butterflies* sitting with *Hanging Wings*, and clapt to their Bodies, like the Wings of *Birds*.

This 3^d. *Section* of *Butterflies* is very large and contains the *History* of a numerous *Tribe*: I should have had great satisfaction, if I could have taken the *Subordinate Genuses*, from any differences remarkable in the *Butterflies* themselves, and not have been forc'd to order them by certaine common Notes Observable in the *Disguises* of the *Catterpillars*: But the want of Particular descriptions, which our *Author* has wholly omitted, has necessitated me to this method; from the bare *Figures*, little of certainty can be gather'd. We indeed Observe the *Antennæ*, of some *Butterflies* to be small like *Wiers*, others *Plumous*: Again some to be very full of *Feathers* upon their *Shoulders*, others upon their *Heads* &c. But these differances are neither certain nor common enough: These of the *Catterpillar* on the contrary, are more *not able*, such as their be *Horned*, *Hary*, *Naked*, *Great*, *Little*, &c. At present we must be content with these, wich is most pardonable, then the putting the *Catterpillar* in one *Chapter* (as *Muset* has done) and the *Butterflies* in another, as though they had little relation to one another.

Number. 18.

The *Catterpillar* of the 18th. *Table*, is to be found in *El-der Groves*, so long as the leaves are tender, and full of juyce, but when they begin to be hard and Withered

E

by

God, P. 3.
Tab. 1.

by the heat of the *Sun*, it leaves them and frequents other places, it seemes to be peaceable and Tame, for it resists not, but flies if it be injured.

It began to Change the 6th. of *October*, and the 25th. of *Aprill*, the Year following 1664. It appeared in the shape of a Blew *Catterpillar*, mixt with a Reddish brown, in the *Hinder-parts*, of his Body.

It lived from the 25th. of *Aprill*, untill the 2^d. of *May*, without moving its Body from the place, and so it died.

But before it died, it layd certain Eggs, of a notable Green colour, which our Peope call *Spanish-Green*.

The Eggs of Butterflies, are to be found in their bodies whilest they are in the Disguise of a Chrysalis, and therefore are undoubtedly essentiall parts of the Female, as much as her Legs and Wings, and in no wise generated by the Male. As soone as they have thrown off all manner of Disguise, they are ready for Copulation with the Male; but if they chance to be Unmasked alone; and not in the company of a Male, they lay instantly their Eggs without Copulation; though probably such Eggs are not Feconde and will not come to hatch.

G. P. 3.
Tab. L.

Number. 19.

The *Catterpillar* of the 19th. Table eats the Succulent and fresh gathered leaves of *Oziers*, these leaves that are white and long. It is a slow goer.

He changed the 10th. of *October*, 1663. And the first of *May*, of the Year following 1694. A very great *Butterfly* came forth. This *Butterfly*, toucht with a *Pin*, fell down *Precipitately*, like one dead, and without motion, so that I thought him dead, of which that I might be certain, I stuck him through with a *Pin*, and yet he shewed no signes of life, but by and by he Expanded his Wings and endeavoured to Fly away, but he had not strength, he livid untill the 11th. of *May*, 1664.

Num-

Number. 20.

G. P. I.
Tab. 65.

The *Catterpillar* of the 20th. *Table*, feeds slowly of the leaves of the *Willow*, and is slow of gate, it abstained from Meat the 24th. of *August*, and began to *Weave* certain *Threads*, but desisted, and often changed its place, untill the 14th. of *October*, at which time it changed its *Green Colour*, into a brown one and dyed, I think that this *Catterpillar* abideth in hollow *Willow Trees*, and is turned into a *Butterfly* in *Spring* : but guessees are uncertain, and as yet I could make noe experiment.

Again of the same. N. 20. B.

G. P. 3.
Tab. C.

The *Catterpillar* expressed in *Number 20th*. Eats Night and Day of the whitest leaves of the *Willow*, and supper over, he withdraws, and hides his Head like a *Tortoise* within his body, least the night Aire or Raine should hurt him, after that I had observed him to abstaine from his ordinary food, I put him into a Glasse halfe filled with Earth, throwing in some Fragments of *Willow* leaves, these leaves he forthwith crumbled to dust, and so kneaded them with the Slimy juice of his Body, that he made him a very convenient place for the Change, the House was like *Willow-wood*, but harder far, so that it could scarce be pierced with a Knife, and one would hardly guesse a *Catterpillar* was within it.

Before the change, in the space of two hours, he lost the beauty of his Colour, and was then of a Liver Colour brownish: As though he was to dye.

He remained in this Change from the 20th. of *August*, 1663. untill the 11th. of *Aprill* 1664. And then came forth of that most harde Shell, a *Butterfly* of an *Ash* Colour diluted, whilst he lived, he scarce moved, and yet run thorough withe Needle, he lived untill the 24th. of *May*.

G. P. 2.
Tab. 37.

Again of the same N. 20. c.

This is a Rare and unusuall *Catterpillar*, he is for the most part to be found on the Sand Hills, which lie along the Coasts of *Holland* and *Zealand*, and feeds on the leaves of a kind of *Palme* (called by our People *Duin-Palme*,) (perhaps *Myrtus Brabantica*,) this Herb was very gratefull to him, but I that dwelt farr off the Sands, could hardly get it, wherefore I taught him to feed of certain *Ofers* or *Willows*, which seemed to be soma thing like the Plant, in Colour ; and dryesse.

This *Catterpillar* had two Tayles and when he was Vexed, out of each Taile he put forth a *Red Sting*, which he bent and brandished, trembling as though angury, and again drew them in, and also he could cunningly draw up his Head, and hide it like *Tortoises*.

He changed the 4th. of *September*, under certain *Willow* leaves, which he had knit close together by certain Threds of his own Spinning in the former of five little Cells, as you see in it expressed in the *Table*, which when It uced with a Knife, it felt as harde, as a Stone. In this manner he lay and moved not, or shewed any signes of Life in Nine Months, and Fifteen Dayes, for the 20th.
of

of June, the Year following, out of the five Cells came forth five *Flyes*: which *Cells* when I had opned I found nothing at all in them, not so much as a Skin, or the Taile or Feet, I wondered all was consumed, I kept these *Flyes* for some time alive, and when I expressed one of them in the *Table*, I gave them their libertie, not thinking it necessary to Paint the rest.

These three Tables of our Authors, I have made one, and put the Histories together: because in my judgment they are about one Species of Butterfly.

(2) *We must commend the industry of our Author in this place, because notwithstanding he succeeded, when he first kept the Caterpillar, he (the next time he lighted upon it) supplied it with Earth and fragments of Leaves, in order to its more convenient change, and it must be observed, that many Caterpillars require a Forriam matter to make a Folliculus of; for the security of the Chrysalis, as Leaves, Earth, &c. Though indeed, others spin themselves one, out of their owne Bowels; or use their Haire for that purpose.*

(3) *The History is compleate in the second History, where are the two Disguises of the Butterfly it selfe.*

The 3^d. History presents us with a By-birth, but indeed a very Rare and curious one: here we note that these five Cells were the Workman-ship of the five Ichneumon Wormes, and very probably they made use of the Caterpillar for stufte to make them Folliculi out off: Just as he says in the 2^d. History, the Caterpillar crumbled the Fragments of Leaves and Earth, and Kneaded them into a Folliculus, of a strange hardness. He hath not Figured that Folliculus in the 2^d. Table, but took the Chrysalis out of it, and Painted that alone.

We now come to treat of, or order all the *not Harie* and *Tuberous Catterpillars*, of our *Author*, and such as have *Hooks*, and *Hornes*, or *Bunches* any where about them.

G.P. 3.
Tab. E.

Number. 21.

The *Catterpillar* which you see expressed in the 21th. *Table*, feeds on *Alder leaves* ; Upon its back stands up two yellow *Hooks*, the rest also of his body is edged of a pale *Yellow* ; but before he changed, he put on an *abscure Green* colour, and the two *Hooks* fell within his body, so that now he was every where plain and smooth.

He began to change the 6th. of *October*, 1663. And appeared in the forme of a *Butterfly* the 27th. of *Aprill*, the year following, which for the great diversity of colours, I could scarce describe, it was most lively, and flew the nights through almost without ceasing, it lived untill the 5th. of *May*, when it died with extended wings.

These sorts of Catterpillars, with Hooks on the middle of their bodies, I do not know that I have yet met with, and cannot therefore guesse at the use of them, if it be not for defence only, as the Author expresses it in the next Histo-ry Number.

Number. 22.

G.P. 2.
Tab. 38.

This *Catterpillar* of the 22d. *Table*, was found in *Flan-*
ders at *de Groeds*, a Village over against *Flushing*, upon
 a *Willow bough*, in that very posture it is expressed in the
Table, it feeds of *Willow-leaves*, but eats very slowly, and
 after eating composeth it selfe again, in the posture
 you see it *Figured*, in the hinder part of its Body represents
 the Head and Beard of a , *Goat*, and it double or draws
 back its foreparts, of or to the hinder parts; when you
 touch it, it strikes at you with Head and Taile, as though
 it was angry. In the Back it has two Hooks, with
 which it stoutly defends it selfe, so that it scares
 all Creatures, that sees it: when it eats, you would say
 its head was bound to its body, by a slender thred, not
 unlike the body of a *Spider*.

The 1st. Of *September*, it rested and began to change,
 in the forme expressed in the *Table*, and after 22 *Dayes*,
 came forth a *Butterfly*, distinguisht with variety of co-
 lours, Elegantly.

This *Butterfly*, before its death, layed its Eggs of a
 Green colour, in divers figures and fashions expressed in
 the *Table*, otherwise then the rest of *Catterpillars* doe.

It lived with me from the 21st. of *September*, untill
 the 3d. of *October*.

This

This Butterfly, layd its Eggs in certain broken Linkes, or Chaines, as is exprest in the Table ; But I suppose she would have layed them in another manner, if the Male had first made them Proliffick, however I affirme nothing: having observed certain Butterflyes Eggs, wrapt and wound in Spirall Lines, about a Twig; and moreover the Eggs of Froggs, and of some Fish, are spawned in Chaines.

G. P. 1.
Tab. 33.

Number. 23.

The *Catterpillar* of this 23d. Table, feeds upon the leaves of the *Sallow*, it is rare to be met with, and I never cou'd find any, but that one only: it daily required fresh food.

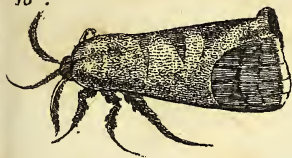
After that I had fed it a whole Month, the knit certain leaves together like a *Net*, in which he hid himselfe.

And then he changed, as I have expressed it in the *Table*.

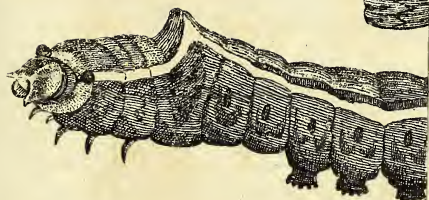
After he had had his fill of leaves, (as I said) he changed the 19th. of *July*, and the 3d. of *August* came forth a *Butterfly* painted also in the *Table*: which lived six *Dayes* without food.

Number

18.



20. b



21.



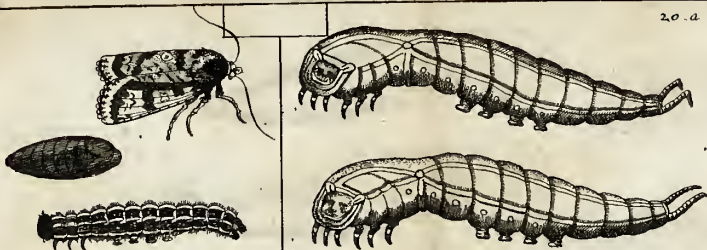
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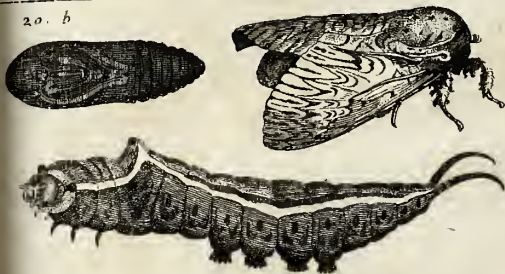
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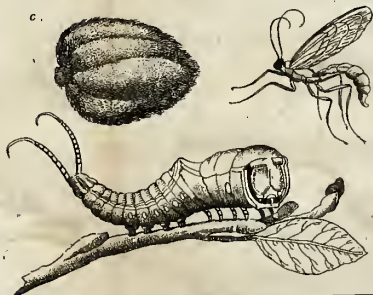
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20. b.



20. c.



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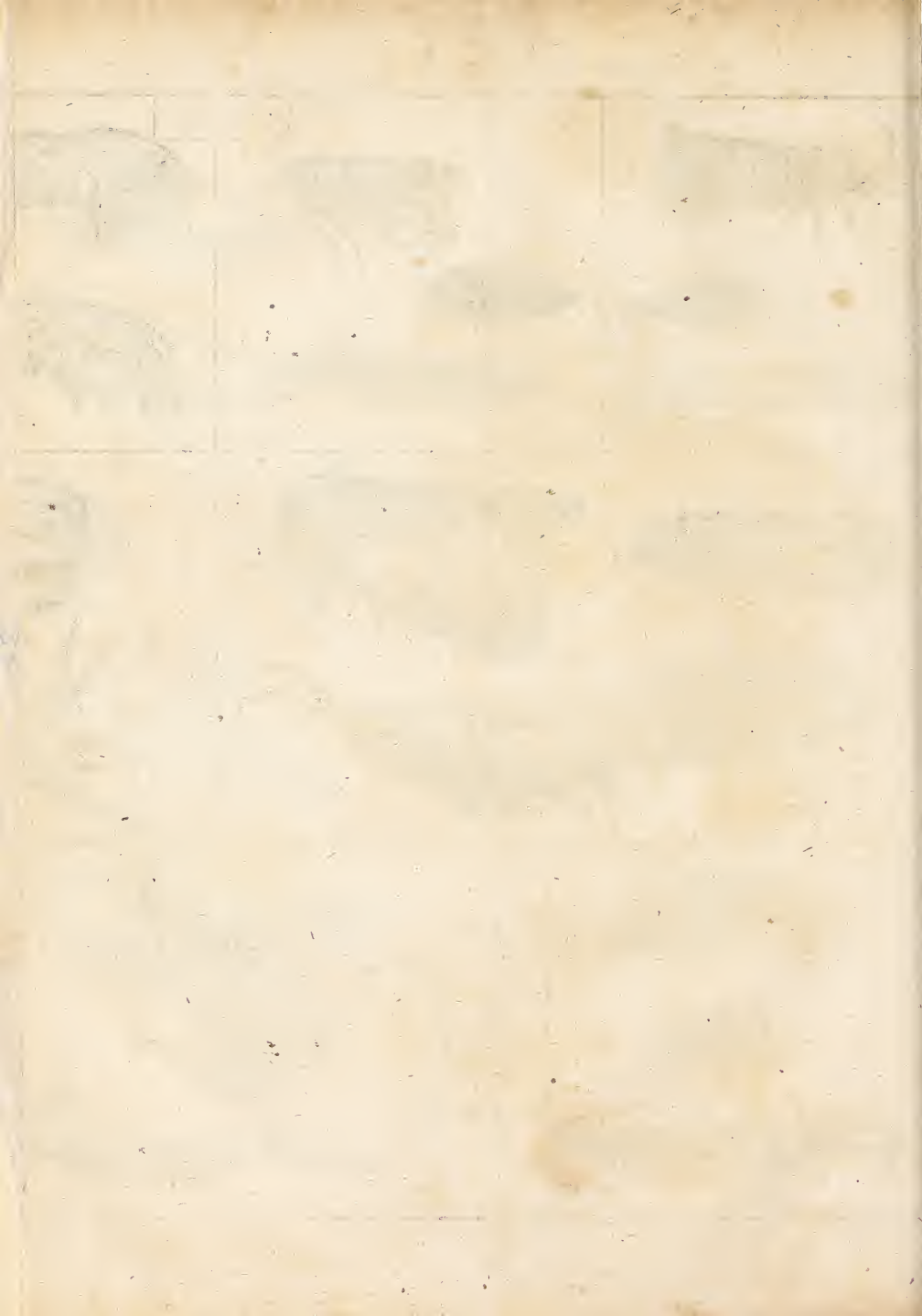


22.



23.





The Green *Catterpillar*, of the 24th. Table, feeds on *Sallow* Leaves, untill the end of Summer. It begins to Eat at break of Day, and eats with great greediness 5. or 6. Hours without ceasing, or other imployment: It never voids its excrements, unless when new food drives out the old. It cleaves so fast to the *Sallow leaves*, that it can scarce be plucked from them; but will suffer it selfe first to be pluckt in pieces. In the hindmost part of its Body it has a sharp *Pinn* or *Sting*, and *Venemous*, which it vses (as soon as it is troubled) to defend it selfe with, with a swift agitation, and every where; that it may Wound them that hurts it, with the motion of the Sting.

The Male *Catterpillars* are Green (as we said) and want those round spots which look like Eyes; the Females are not so Beautifull, but of a more Grayish colour.

Before that these *Catterpillars* change, they move long and much, and exactly clean themselves of all Excrements: they make themselves no covering (as all other *Catterpillars* are diligently wont to doe) but putting off their Hackle, they are changed into *Chrysalis's* as is expressed in the Table.

This change happned the 19th. of September, 1663. and the 5th. of May, the Year following 1664. came forth a lusty *Butterfly*, which lived till the 14th. of May fasting.

I could never Observe from these kind of *Catterpillars* a perfect and compleat *Butterfly*, but with contracted, and as it were scorched Wings, not to be expanded, or fit for flight. They are wont to lay their Eggs before they dye.

(1.) I note particularly the observation of our Author of New food driving out the Old; which must be either that the intestines are not so very long, and many as in Sanguineous Animalls; or this is done upon the account of a New fermentation.

(2.) Its a curious Note, the distinction of the Male, and Female Catterpillars: this would be certainly known in order to the compleating their Historys, for as Malpigijs observes, the Eggs are of one colour, when layd after Copulation and of another without it.

(3ly.) A probable reason why our Author, never could have a compleat Butterfly, of this Kind, was, because he did not furnish the Catterpillar, with convenient matter for a Folliculus, and so in some measure starved it.

G.P. 1.
Tab. 24.

Number. 25.

The Catterpillar of the 25th. Table, feeds of Sallow-leaves, it is armed both before and behind, in the forehead it has a kind of hard Shield, but no Eyes, that I could Observe, and in the hindermost part of the body, it has a Prick or sting, hard and stiffe, it is of a Green colour mixed with Blew, I take it to be Venomous: if it be touched, it moves that part of the body, which has the Sting, and does as though it did defend it selfe with it.

It cleansed it selfe, and began to change the First of April, in the form expressed in the Table, in which condition

dition it remained for 55 Dayes, not obscurely, representing the Face of a Man with a Beard, and in the other parts a Child in Swadling Cloathes.

The 25th. of May, broke forth a *Butterfly*, figured in the Table.

This Catterpillar, feeds also of Ligustrum or Primp leaves, and is to be found about Primp hedges, with us in England : It is a most beautifull Creature.

Number. 26.

G. P. 3.
Tab. T.

I v'll to call the *Catterpillar* of the 26th. Table the *Elaphant* because of its Snout, it feeds of *Vine leaves*, when it has done feeding it draws up its Head within its Body, and hides it selfe like a *Tertoise*, its very fearefull, for being touched never so lightly, it trembles and is astonished, enough to cause the same affections in the beholders. It can turn its Snout very dexterously every way, and what its layes hold of with it, its hardly to be got from it, for it hath great strength : Its very quick of hearing, for at the least noise it feares and contracts it selfe, as I have often tried.

The time of its change approaching, it abstaines from meat, and seeks a fit place to rest in, and to that purpose I put it some bits of Wood and *Vine leaves*, of which and the juice of its Body mixt, it made it selfe a House, and changed in it, the 4th. of September, 1665. And lived in it untill the 16th. of Aprill and longer, which thing I observed by mine Eye and Touch, being uncertain what wou'd become of it.

When I touched it, and put it in the hollow of my Hand, I observed it as cold as Ice, and yet moved most strongly.

This is most certain (this Animall) did live without food from the 4th. of September, 1665. untill the 16th. of April, 1668. To which its coldness and continuall rest, did seem to conduce very much, from which and the Tenaciousness of its juice, it would be long in wasting, which thing is also frequently experienced in other Creatures, which rest in winter, and eat not till the Spring or summer.

This History is imperfect, there being only the Disguises and not the Butterfly : I am apt to believe the Chrysalis dyed, by being taken out of its Foliculus, and therefore in vain the Author expected to see it hatched, or a Butterfly break forth.

As to its coldness ; I can witness that in the depth of Winter, and in the very deep Snow, I have found both Catterpillars and Hexapode Worms, lying upon the Snow, and therefore have crawled out upon it. I say these Catterpillars were so hard Frozen that thrown against a Glasse, they made a sound like stones ; but put under the Glasse and set before the Fire, did quickly crawl about, and bestir themselves nimble to get away.

G.P.3.
Tab.V.

Number. 27.

This kind of Catterpillar expressed in the 27th. Table: Is amongst *Corne*, and there feeds, of a certain Bind-weed, (*Hedera minor*, called in Dutch, *Wee windé*) and

24.



26.



27.



24.



26.



27.



25.



28.





and is at least two Hours at one meale. Its excrements are of a determinate figure, expressed in the *Table*, it is of divers colours, with two black Lines on its back, betwixt which two, is there one of Green, the rest of its Body is Greenish, in the hinder part of its Body is there a Red and crooked sharp Horne, and in some places is there a mixture of White and Blew, it is of a quick Eare and touch, for upon the least noise, it will not move of a long time. The *Author* prevented by Death left no more.

This History is confessedly imperfect, there being nothing but the Disguises of a Butterfly expressed. I could have wished the Author had taken all along the pains he has here shewed, in more carefully describing in words the Painting of the Catterpillar, but he relyed upon his excellent pencill too much, for he had eise leisure and opportunity enough to have done it. This Catterpillar is Cornigerouse, and therefore we put him amongst his like.

2. *As for the determinate Figure of the Excrements of this Catterpillar; if the Author had well observed it, he might have found that particular common to many Species of Catterpillars. I take the cause of it to be, the Figure of some parts of the Colon, or Gut wherein these excrements are baked and molded.*

Number. 28.

G. P. 3.
Tab. Z.

The *Butterfly*, of the 28th. *Table* : was sent from *Paris* to the *Author*, for its beauty and vastnesse, in which it far exceeds all others, to the end upon occasion, he might

F 3.

find.

find out his Origin. It was taken in the Kings Garden, and given to *Dr. Borellius*, the *States Embassador* : Who carefully transmitted it to him.

In my Judgment this Butterfly will be found to have a Disguise, like some of the next precedent : And to have been changed from one of the Cornigerous Catterpillars : but it is improper to talke here of Origin, because it is perfect of it selfe, and is the Mother of the Catterpillar, which it is changed from.

We Proceed in the *Histories*, of the smooth and not Hairy Catterpillars.

G. P. 3.
Tab. F.

Number. 29.

The Catterpillar of the 29th. Table, feeds of Colly-Flowers. One in a corner hid under a Paper was found dead, out of whose Body the 10th. of September, 1663. 12. Wormes came forth, which in the space of about four Hours were turned into so many Eggs, the 2d. of July, the

the Year following 1664. out these 12 Eggs, came 12 *Gray Flies* [one of them expressed in the *Table*.]

Another died the 12th of *September*, whose relicks were changed into a *Worme* the 17th. of the same Month, which *Worme* broke forth of the skin of the said *Catterpillar*, with great strength and force.

A 3d. *Catterpillar* of the same *Species*, changed the 25th. of *September*, 1663. and the 8th. of *May*, the Year following, it appeared in the forme of a *Butterfly*, of a flow gate, and no pleasant colour, it lived fasting Nine Dayes.

Note the First Catterpillar, our Author plainly says, Died, and the Carcase undoubtedly was Fly-blown, so that the 12 Wormes were Maggots, of some small Flesh-flies, and accordingly they proved, one of them being Figured in the Table.

Again we believe the same of the Worme, which broke out of the dead Body of the other, but the Author being silent, what became of it, we shall not concerne our selves to guesse of what Race it was.

Number. 30.

G. P. 1.
Tab. 67.

The *Catterpillar* of the 30th. *Table*, feeds of divers Herbs, amongst the rest, it chiefly delighted in *Ground Ivy*, but it is delicate and choice in its meat, for it will eat none but fresh gathered: it changed its Skin oft times, for it seemed so hard, that the Body being notably increased

creased in bulk, it was necessary that the skin shou'd be broken; and another grew under it.

Its skin being cast, it did not move for one whole day. nor cou'd it feed, because of the tenderness of the new skin which was hardened by the Aire.

It changed the 5th. of *August*, as is exprest in the *Table*, and the 26 of the same Month came forth a *Butterfly* figured in the *Table*.

These *Butterflye*, are wont to fly about chiefly in the night, but are careful to avoid the flame of Fire and Candle which thing happens otherwise to the rest of *Butterflies*.

This *Butterfly*, Lived 6 Dayes without food.

Note here our Author gives a good reason of the casting of the Skins of Catterpillers, saying that it grew hard and was not further to be extended, so that of necessity the growth of the Animall cracks it: The like I have Observed in Spiders: This also holds good in the Hornes of Animalls, which caste them, as Staggs: Which when they are at their full growth are deprived of all further nourishment, become hard, and are succeeded by others which pullulate; the like is observed in the Hair of Animalls, and the leaves of Plants.

It is no lesse certain that all the Skins are one under the other, each successively Pullulating, as in the leaves of Plants.

G. P. 3.
Tab. 25.

Number. 31.

I have often observed the seed of *Heliotropium* shed upon the ground, to be, preserved all Winter, though never so Colde and to Germinate in the Spring: The *Catterpillar*,

terpillar, of the 31st. *Table*, eats this *Herbe*, it lyes under ground ith Day, and comes not out untill the Evening to seek food, I kept this *Catterpillar* under a Glasse, bnt I experienced that it never moved, or eate any thinge save ith evening.

After that it had duly cleansed .it selfe, it began its change the 17th. of *August*, & remained in that condition, untill the 9th. of *June*, in the Year following, so that it was like a dead thing without food almost 10 Months.

Afterwards came forth a *Buttersly*, marked on each Winge, with the Letter O. And Figured in the *Table*.

Here we must note, how necessary it is, in order to the compleating of Naturall History, that our Naturallist shou'd be well skilled in Plants: Viz. The Food of most Insects. *Heliotropium*, is a Name given to many Plants, as to one Species of *Tithemall*, also to the great Indian *Marigolde*; again to other Plants, Famous for Dying a Blew Colour, &c. So that the Author has left us in the Darke for the Food of this Insect; for want of a more particular Title of this Plant.

Number. 32.

G.P.1.
Tab.42.

As soon as *Mulbury-leaves* are spred, the *Catterpillar* (called *Bombyx*) of the 32 *Table*, is Hatched, and feeds on them, although in their Infancy they will Eat *Wilde*

Cichory and *Lettice*, for the *Mulbury* is late in putting forth its leaves.

Before that these *Catterpillars* makes *Silke*, they cleanse themselves from all Excrements.

One Hundred and Threescore *Catterpillars* (160.) are wont to make one Ounce and 80. Graines of *Silke*.

The *Catterpillar*, Figured in the *Table*, changed the 14th. of *September*, and the 24th. of the same Month, that is in the space of 10 Days, it broke forth a white *Butterfly*.

Before these *Butterflys* Couple, both Male and Female are exactly purged, and then they are exactly Coupled by the Tayles end ; after that the Female layes a 160. Egges which are all Infæcund, and wither to nothing unless the Female couple with the Male.

Sometimes they do againe Couple after Laying, but they Lay no Eggs, for the *Butterflys* are wont to Dye within Fourteen Days.

See MALPIGIVS DE BOMBYCE.

Number. 33.

The *Catterpillar* of the 33^d. *Table*, Eats *Plumtree* leaves it's a little eater, and sleeps much, you will often finde Two of them together at rest with their Heads inward bent to the middle of their Bodies.

Both of them two companions began to change the 25th. of *May*, as is expressed in the *Table*, and from each of them came forth a *Butterfly*, after 31 Days, that is the 26th. of *June*, of a Yelloish colour, and which wou'd not fly in the Day time.

These

These kind of *Butterflies*, seem to be weak fighted; they care not for flying, but runn swiftly, and they runn into some darke corner, not caring for the light.

They live of Honey gathered out of Flowers, and therfore have a long Tongue to fetch it out of the Bottoms of flowers.

This Tongue they carefully, when they runn, roll up, to preserve it from injuries, they lye in darke places in Winter time.

Number. 34.

G. P. 2.
Tab. 24.

The *Catterpillar* of the 34th. Table, Eats of the leaves of that *Worm wood* chiefly, which grows upon the Sea banks, I found it sitting upon that Plant, in an *Island* of *Flanders*, near *Axella*, and *Neuza*, they are their whole Body throughout, exactly of the colour of *Sea Worm-wood*, they are fierce, and Subtle and strike at whatever touches them, they hold not very fast, they runn swiftly, where they feed they scatter much *Worm-wood leaves*, and when they are never so lightly touched (of which they are exceeding impatient, tremble and feare) they cast themselves down also, and hide themselves there, where you can scarce discern them; because they are most exactly coloured like the Plant they feed on: they save their Head by covering of it with the hinder part of their Body: in the Face they are tender (as I have experienced) and soon killed with a small hurt in that part, and therefore are very carefull of it.

Again I do wonder at their so well enduring of colde
G 2 and

and wet that you can scarce kill them, and although they seem to be quite storded, yet they will revive, for I cast some of these *Catterpillars* into cold water, and Kept them 12 Hours in it, then I took them forth stiffe with colde and extended, so that I cou'd not discerne the least signes of Life or motion in them; but exposing them to the Sun, within halfe an houre they came to themselves and cou'd not be discerned from their fellows that had not been steeped. If you in like manner Drown Flies, in Bear or Water, and let them lye in it all Night, and having taken them out, sprinkle them well over with the Powder of Chalke, they will by and by creep away, which seemed Dead, the heate of the Chalke which I look upon as a kind of unquenched Lime, put Life into the Flies, as the heat of the Sun into the *Catterpillars*, the Sun causing the Vitall juice to returne into, and passe the benumbed Members.

Further it is to be observed, that this steeping in cold Water, gaine these *Catterpillars* a good stomack, and made them eat more greedily then their fellows which were not served so, as men seem to have better stomacks in Winter, then in the heat of Summer.

These *Catterpillars*, make themselves commodious nests to change in, of *Worm-wood* scattered upon the ground, and shutting up themselves, they change therein.

This *Catterpillar* changed the 4th. of September, and lay in that condition (figured in the Table) 10 Months, 18 Days.

And the 19th. of July, came forth a *Butterfly*, of a wonderfull shape, and accouterment: it lived not above foure Dayes, for I knew not what to feed it with, that it wou'd Eate.

Number. 35.

G. P. 2.
Tab. 27.

The *Catterpillar*, of 35th. *Table*, delights to feed of *Brazibles*, and of the *Vine*, he is slow of motion and gate, and yet will seeme displeased if you injure him, and defend himsele against violence; I fed this the space of foure Months, which time being over, he made himsele a little House of fair *Paper*, the leavcs of *Balme* and *Spittle* of his owne, to change more sassy in.

He changed the 12th. of *September*: and remained in that condition *Figured* in this *Table*, Eight Months compleat no more nor lesse: for the 12th. of *May*, the Year following came forth a *Butterfly*, not unbeautifull, but impatient of Hunger, for I knew not what to Feed it with, and Dyed within one Day.

Number. 36.

G. P. 2.
Tab. 28.

The *Catterpillar* of the 36th. *Table*, is not given to any peculiar food, as most other *Catterpillars* are, but Eats of every Herbe you give it, it greedily Eats *Rose leaves*, *Mints*, wilde *Amrache*, and many other Herbs; he never stired ith Day time, but as oft as I observed him at night, I found him Eating, and he seldom left any thing of that I gave him: He retired when, he had done Eating, under a Dry leafe, rather then a Green one.

This *Catterpillar* when he had spent a whole Day in Creepeing about, he rested under certain leaves ; and there changed the 23^d. of *September*, and remained in that condition, Figured in the *Table*, 9 Months and 4 Days ; for the last of *June*, the year following, came forth a most beautiful *Butterfly*, painted with divers colours wonderfully.

There are some of these *Catterpillars*, twice as big and as long as others, I took a lesser *Catterpillar* of this sorte, and I fed it long, but as the season of the Year declined, and leaves grew harde, he could not Eat them, he not withstanding had endeavoured to change, but nothing came of him, and I left my experiment.

But standing at my Doors, set about with *Elmes*, I saw a great company of *Catterpillars* upon an *Elme* bough upon which without doubt their Mothers had laid them.

These little *Catterpillars* let themselves down, by certain single Threds out of their mouthes, they were all exceeding Green, and Pelluced, I took them and fed them with *Elme leaves* under a Glass, they all Housed themselves with houses of Sand and Spittle, against the cold and of winter. In Spring I let them seek their own food.

I have not all the satisfaction I cou'd wish, in Translating this History, I find it so imperfect and disordered: undoubtedly the Latin Translator is much to blame, I have mended the Text, where it speakes of the great Catterpillars being the Mother of the little ones; then which nothing can be more absurd: again we have here an Aurelia, put for a Butterfly &c. If it were matter of Fact and positively asserted by our Author, as his Observation, I shou'd not have alter it, but its expressed, as a conceit only.

Number. 37.

G. P. 2.
Tab. 31

The *Catterpillars* of the 37th. Table Are rare : I found this in a *Sand-hill*, the 23d. of June, sitting upon *Grasse*, which grows there (called in *Dutch Duin grass*) and I took it home with me to try what cou'd become of it.

The Day after a Little *Animall* like a *Beetle*, crept forth of the hinder parts of its body, *Figured* in Table, 37.

The *Catterpillar* after this refused all food, and contracting and winding its body, it changed at length.

The little *Animall* lived, but stirred not much, only shaked it selfe, it changed *snake* like, and the skin being cast, it was of a Golden colour on the fore part of its Body, and russet the hinder, it had six Feet, and two little Hornes, it eat *Rose leaves*, and the flowers of *Elder*.

The *Catterpillar*, the Mother of this *Beetle*, changed the First of July, and remained in that condition untill the 21st. of the same Month, then a beautilfull *Butterfly* came forth which lived 9 Dayes fasting.

The birth of this Beetle, is an odd Phenomenon, I am of the Opinion that here is a great mistake, because the like once happened to me : That I thought to have Observed a Beetle borne of a Catterpillar ; but I question my owne Observation. The Catterpillar came to good ; and here is the Butterfly perfect. I guesse this Beetle might well be by accident, and unobserved brought in, and layed in the same place, where the Catterpillar was kept ; and so I formerly thought of my owne Observation : But I affirme nothing.

Number.

G. P. 2.
Tab. 32.

Number. 38.

The *Catterpillar* of the 38th. Table fed of *Marigold* leaves, or *flowers* it puts off its skin foure times, and in the scarcity of Food they Eat one another; I have indeed Observed other *Catterpillars*, to Eat one the other, but those do it greedily.

After I had Fed this 14 Dayes, and that he had clen-
sed himselfe of excrements, he changed the 9th. of *August*,
as is *Figured* in the Table, and after 18 Dayes, the 27th.
of *August*, came forth a *Butterfly*, having six Golden Spots
upon his Foure Wings: The Foure lesser Spots were up-
on each wing one, the 2 bigger Spots on the upper paire
of wings only: This *Butterfly* lived a Hungry Life untill
the 6th. of *September*, I not knowing what to give it to eat.

*We Observe in this History that Butterflies, when Cat-
terpillars, are unlike themselves, not only in the disguise,
but manners two; they then Eat one the other, but are
uery peacefull, when in a Perfect state, and unmaskt,
Spiders will Eate Spiders, &c.*

*I say again I cou'd have wished the Author had taken the
care of discribing to us the Paintings and Colour of
the Insects, which he delineated with his Pencil.*

Number.

Number. 39.

G.P. 2.
Tab. 33.

The *Catterpillar*, of the 39th. Table: Hath his Origin from rotten *Willow*, and is found lying in the Bodies of those Trees.

In this Tree is found a certain fat juice, not unlike *Turpentine*, for of the Saw-dust of *Willow* a Vernis is wont to be made by boyling.

This *Catterpillar* lives of this fat juice, and is to be found in the marrow of that Tree, both Summer and Winter, for our *Dutch-Boors*, when they cleave them in Winter, often light upon them: But to have their change they must either keep them in a warmer place, or not take them out of the Wood.

These *Catterpillars* are of a redish colour, like boiled *Cray-fish*, and they smell ranke.

In the Months of *June* and *July*, I have met with them creeping in the High-ways, then seekeing out a convenient place for to change in; which choice is an old decayed *Willow*, for its softness, and for its food.

Concerning the manner of the Propagation of these *Catterpillars*, it is obscure, and not fully known to me, and cannot easily be found out, for on the outside of the Tree are no chinks or cracks, no (not small) holes, and yet *Catterpillars* are to be found within.

This is most certain, that I have found these often in the *Pith* of *Willows*, and it is likely they are there generated of corrupt Wood by heate, as other *Animalls*, which are spontaneously begot.

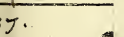
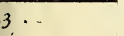
Also haveing very often tryed to keep them to know what would become of them, they all Dyed, and when I did stop up their Dead Bodys in Juggs, I had a multitude of little Flyes, which I say without doubt were Generated of heat and corrupted matter.

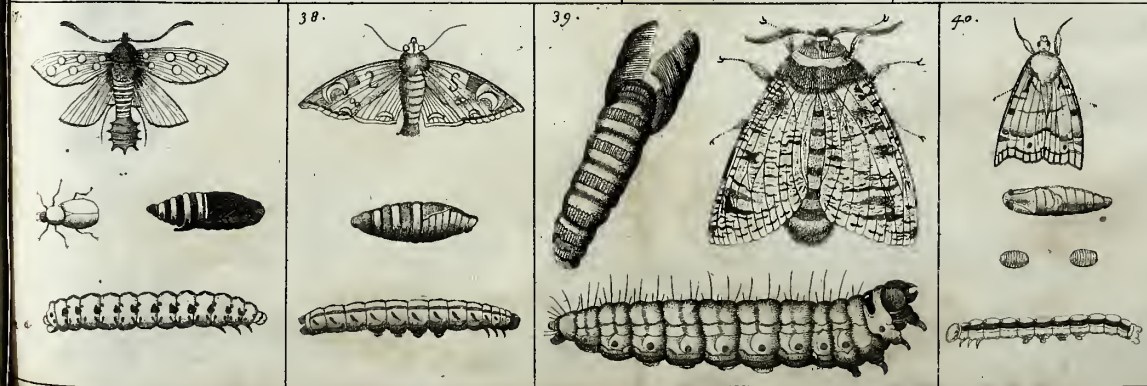
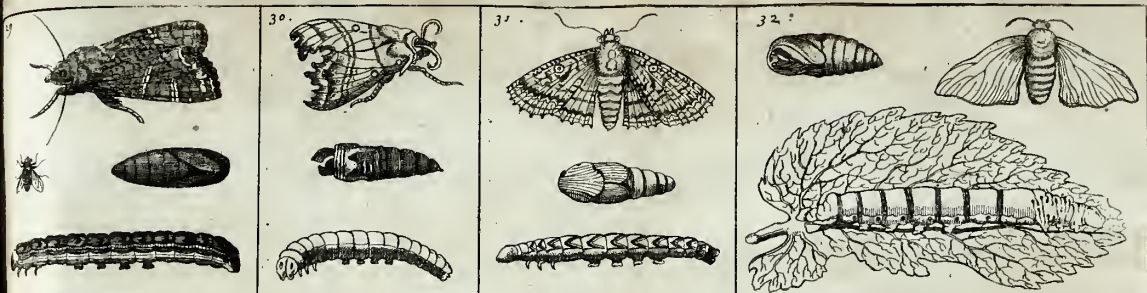
When these great *Catterpillars* are at their full growth and bigness, they seek out where to rest, in order to their change, it changed in an Old and dried *Willow Tree* the beginning of *June*, as is *Figured* in the *Table*, and the 23^d. of *July*, came forth a great *Butterfly*, which moved not out of its place, it was *Hatched* in; and *Dyed* there after *Eight Days*, shutting its *Wings*.

This very Catterpillar, I have also found in the Body of an Oake Tree, new Felled and Sawn a sunder, wherein it makes holes, you may turn your Finger in: The Romans had a way to feed these Fat, and did eat them as a delicious Food, they called them Cossi. It has a very rank and strong smel, is a little hairy, and of a Reddish, but pale colour.

2^d. *The remarke of Willow Sawdust affording a resine, is curious and the first time, that I met with it in any Author, Pliny (lib. 16 .c. 18.) says the Gaules had a way of extracting a Bitumen from Birtch, which is as improbable, however to this purpose some of the Old Trees we dig up out of our Mountainous Mosses in the West-riding of York-shire, are certainly no other then Birtch, and when dry do Burne with as lasting a Flame, like Firr-Tree splinters, which gives the occasion of calling them Firr-wood.*

3^d. *As to the Spontaneous Generation of this Catterpillar, and other Insects, I have declared my opinion in the Negative. This is most certain, that these Cossi are hatched of Eggs layd by their Animall Parents, and that these very little Worms are capable of piercing the Tree, by little and little, that is as they Eat, that probably these little Holes grow up againe, after they are once fully entered, at least so as not to be visible, but to a very dilligent enquiry. Again probably they change not, but are in the Disguise of a Catterpillar, for many Tears, which is agreeable to my own observations, all which things render the Observation very tedious, but I little doubt, the truth of it, and that this Catterpillar,*







pillar is propagated by its Anmall parents, the Butterflies:
as all other Catterpillars are.

Number. 40.

G. P. 2.
Tab. 3.

The *Catterpillar*. of the 40th. Table.: I took the 13th. of *December*, and fed it with *Sallow leaves* (its usuall Food) as long as I could find any of them; but when I cou'd get no more of those leaves it fasted all Winter; but it Daiely shefted its place, its life and motion were so weake, as scarcely perceiveable.

The 24th. of *March*, I offered it the tender Buds of *sallow*, but it Eat not: the 2d. of *Aprill*, I put again before it *Sallow leaves*, and then it Eat them, for then they were bigger, and more Nourishing; the same thing I observed in other *Catterpillars*, not one only; that they abstained from tender young Herbs; but eat them greedily, when a little more grown up.

The 6th. of *Aprill*, holding fast by the feet upon the edge of a piece of Paper, it crept out of its skin; that I seemed to have a *Catterpillar* upon the Paper, for it was just like (as to colour) the skin it crept out off.

When it cast this skin it parted with an Egg of the same bigness, that *Ants* Eggs are usually of. The 14th. of *May*, is cast another skin, and again parted with another Egg: Both the Eggs came to nothing.

The *Catterpillar* changed the 13th. of *June*, as is Figured, and after 10 Days came forth a *Butterfly*, which fasted Seven Days, and Dyed.

Note, that is no unusuall thing with these kind of Animals; I meane *Catterpillars*, to goe on, or suspend their Eating, and consequently their groth, as was observed.

2d. Here indeed is a perfect change, and a By-birth besides, I guesse the By-birth to be the Chrysalis of Ichneumons, because the Catterpillar lived: And perhaps from this Observation we may guess something of the place of Ichneumons Wormes feeding; which is probably not within the Body of the Catterpillar, but betwixt the skin or the Exuviae only.

For here every time the Catterpillar casts a skin, it parted with an Ichneumon, and the reason (why these Ichneumon Chrysalis are Figured as Foliculi, and so first appeared: whereas others most usually Pierce the Catterpillar in the forme of Wormes, and change afterwards) may I say well, be the Catterpillars fasting all Winter: so that the Catterpillar not haeving cast all the skins to the last, these Worms could not break forth: Or were not fit and ripe so to do, but spun themselves Foliculi within the Catterpillar, before their time, and so came to nothing.

Thus far the smooth and not Hairy Catterpillars whose Histories are more perfect, that is having both the Disguises Figured and the Butterfly two. Here follow the lesse perfect Histories (those in which the Figures of the Aurelia's are only omitted) of the large sort of smooth Catterpillars.

G. P. I.
Tab. 14.

Number. 41.

The Catterpillar of the 41st. Table, feeds on the Leaves of *Bursa Pastoris* and *Senecio*: Although most Catterpillars feed on the leaves of Herbs, and are therefore to be found upon them, yet this Catterpillar of the 41st. Table, lyes hid underground oth day time, and comes not out untill

untill the Evening; and Eats as much ith night, as is sufficient for all the day, like *Batts*.

This *Catterpillar* changed the 28 of *April*, and remained so untill the 9th. of *June*, when a *Butterfly* came forth which appears not in the Day, but seeks his food in Gardens amongst the Flowers.

History. 42.

G. P. 1.
Tab. 30.

The *Catterpillar*, of the 42th. *Table*. eats the Leaves of *Violets*. If it happen (when two or more are fed together) that one of them change early before the rest, and there be a want of meat, the *Catterpillar* not yet changed will deuower the (*Aurelias*) which it may well doe, these being not in a condition to resist and move.

This *Catterpillar* changed the 13th. of *October*, and continued in that condition untill the 6th. of *June* the year following, at which time came forth a *Butterfly* of a Blewish colour Figured in the *Table*.

Number. 43.

G. P. 1.
Tab. 37.

Although flowers are not much infested with *Catterpillars*, yet are they not free from them, the *Catterpillars* of the 3^d. *Table*. chiefly Eats *Gilliflowers*, I know by experiance that the *Catterpillar* lyes under ground all Day, and comes not out before Sun sets.

He changed the 30th. of *July*, and continued so untill the 23^d. of *September*, and then a *Butterfly* came forth of a Redish colour, : Figured in the *Table*.

Naked Catterpillars, are a more acceptable Food to Birds, then such as are Hairy, as I have found by experience in
H 3 feeding

feeding Red-breasts : I guesse the reason to be, that the Hair is noxious to their stomachs. And indeed, it is my opinion, that the Vesicateing faculty of Insects is much more in the Haire; then in any other part: I haveing Blown into my Boxes, where sometimes I kept a sort of Hairy Cimices, had in a few Minuts after all my Face Blistered. These Naked and therefore more innocent Catterpillars, by the instinct of Nature seek to preserve themselves, by getting under Ground in the Day time, when the Birds are stirring.

G.P.1.
Tab. 56.

Number. 44.

The Catterpillar of the 44th. Table, feeds of Dogs-mercury, as soon as it perceives any thing it is not u^st to, it casts it selfe upon the ground, and lye s round in Ball, as though it was Dead.—It changed the 30th. of July, and the 26th. of August, came forth a Butterfly, fig in the Table, of a rare shape and colour; the fore part of its Body was Hooded as it were, it lived long without Food, and was very fearfull

What the Plant Mercurialis may be I cannot guesse, many there are that bear that name, as Bonus Henricus, Dogs mercury, &c.

G.P.1.
Tab. 56.

Number. 45.

The Catterpillar, of the 45th. Table, Eats the leaves of Louage, only in Night, never o^rth Day-time, I found it lying in the cracks of a Cherry-tree, it changed the site of its Body often in the Day time, it u^st to lift up its body, as though it looked about it watchfully.

Before

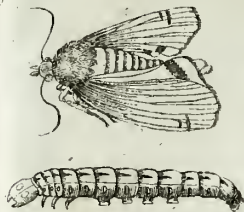
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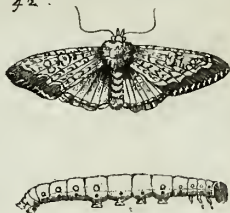
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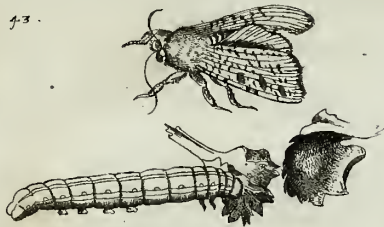
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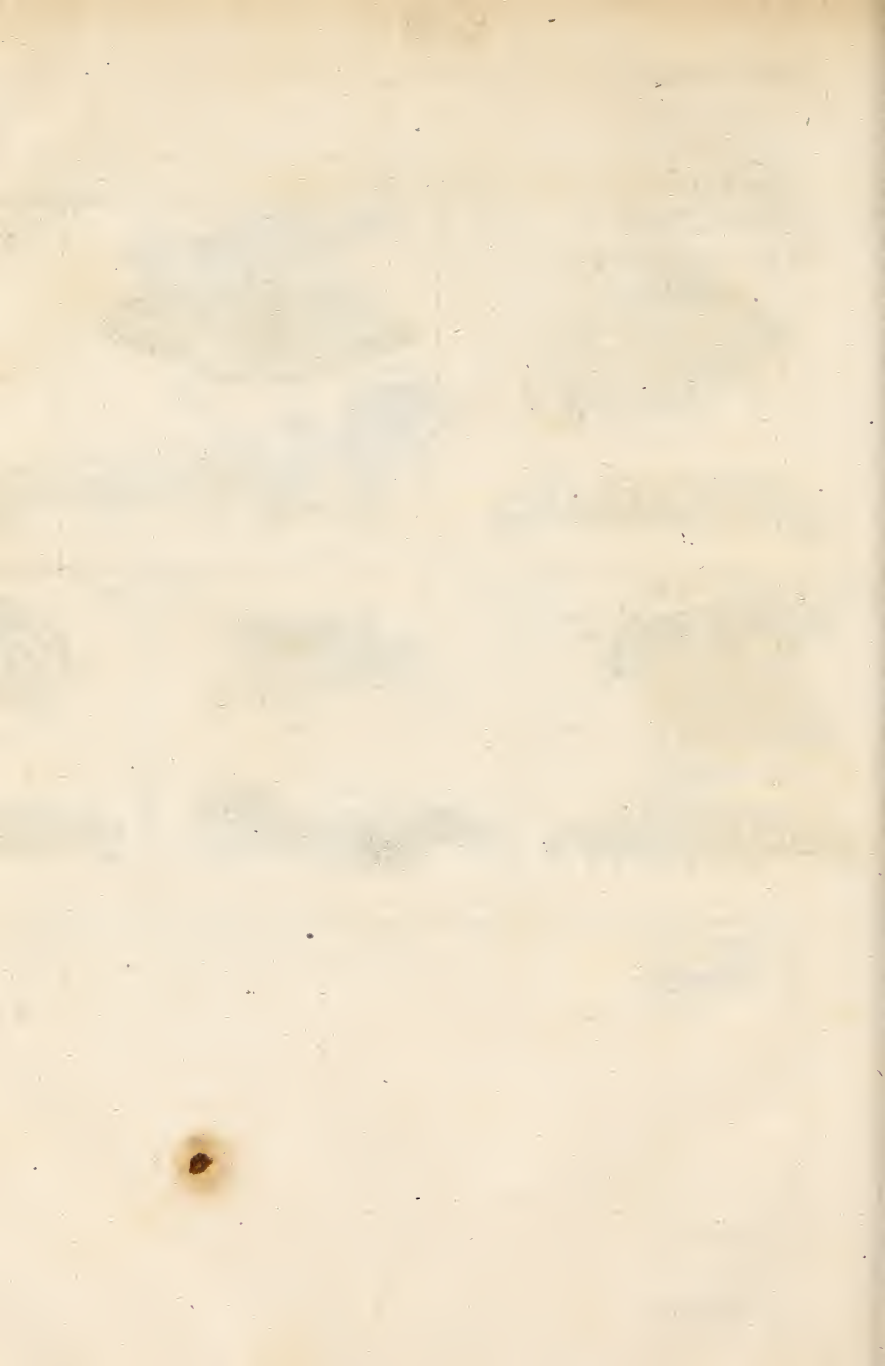


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47





Before it changed, it cast its skin, with great difficulty, Sweating all over small watery drops : having a new skin it rested for a time, and changed the first of *June*, and the first of *July* came forth a darke coloured *Butterfly*.

*Malpigi*us, hath well compared the casting of skins in *Catterpillars*, to the breeding of *Teeth* in *Children*; because both are often accompanied with dreadfull Symptoms.

Number. 46.

G.P. I.
Tab. 60.

The *Catterpillar* of the 46th. Table, I Fed the space of two Months, with *Ground Joy* in *Dutch Onderhave*. Before it began to change, It purgeth it selfe, and changed the 28th. Day of *Aprill*, and a very Beautifull *Butterfly* came forth the 26th. of *May*, Figured in the Table, it had so elegant a luster, that it could not be Painted without *Guilding*, it bears two equally long *Plumes* upon the Head, it is wonderfully adorned about the Eyes, and Armed, under the Eyes appear two *Teeth*, it Lived Three Days without food.

I understand not what our Author, means by the two *Teeth* under the Eyes of the *Butterfly* ; This is a mistake I guess : *Butterflies*, indeed have a *Tongue*, *Trunk*, and hollow *Pipe* by which they Feed on *Flowers* : But I am yet ignorant of their haveing *Teeth*.

Number. 47.

G. P. I.
Tab. 61.

The *Catterpillar*, of the 47th. Table : Is very curious and delicate in its Food, which are the leaves of the *Cherry-tree*.

It changed the 6th. of *June*, and the 14th. of the same Month came forth a *Butterfly* Figured in the Table, of an unpleasant colour, and Beggar-like drefs, it lived not long, sad and moving little.

This

This is a very quick change, the Butterfly throwing of the disguise of an Aurelia in Eight Days, this was in the heat of Summer, Malpigijs observes, the Butterfly of the Silk-Worm, not to doe it in the hottest season in lesse time then 10 Days, I wou'd have it tryed whether or no it wou'd succeed, that if a Chrysalis, change late ith Tear, was put in a warme place, immediatly after its change, it wou'd soon throw off that disguise, and become a Butterfly, the place might be insted of an Elaboratory, or Glasie-house: All the parts of the Butterfly are budded in the Chrysalis; But are not sprouted, Explicate, and hardned.

We come in the next place to such Historys, of the large Smooth Catterpillars, where we find either the change imperfect, that is some by birth, Figured in stead of the Butterfly, or the Catterpillar, only, and no Aurelia, by Birth or Butterfly at all.

G. P. 1.
Tab. 18.

Number. 48.

The Catterpillar of the 48th. Table: Eats Violet-leaves, it can hardly endure the Sun beames, and therefore gets under Ground, it can hardly be found because it is green, like the leaves it feeds on, it creeps fast enough; save that when it perceives any thing, it is not us't to; it moves not, but lyes as though it were Dead.

After that it had exactly cleansed it selfe of all excrements, it changed, the 4th. of September, and abode in that condition without Meat or motion, to the 9th. of May, the Year following, at which time came forth a Fly, Figured in the Table.

This

This is an ordinary Flesh-fly, and therefore the Aurelia was Carrion and putrid, when the Fly fed upon it. To know when a Chrysalis is alive, is by touching the Tail of it, for although it have no locall and progressive motion, while in that state, yet it can wag that part very briskley: As to Aurelia's fasting so long; as such they must fast having no Organs to eat, and being in disguise; but whether thy are not Fed, by a nourishment equivalent to that of Infants in the Womb, Is to be inquired after.

Number. 49.

G. P. 1.
Tab. 19.

The Catterpillar of the 49th. Table: I fed 13 Dayes with the Leaves of *Willow trees*, when it began to Abstain from Meat, it turned and tossed every way with great anxiety, and labour, and then it gently reposed and changed the 17th. Day of *July*, and the 20th. Day of *August*, came forth a *Yellow Fly*, not unlike a *Bee*: Figured in the Table.

We have said that Ichneumons are of the Wasp kind, it is therefore no wonder that some sort of Wasps or Bee, neare alike in shape to that which we vulgarly own & call Wasps, shou'd be nurished after the same manner, that is, shou'd make the bodies of Catterpillars, the place of their nourishment, if not the matter too, as in this By-birth: This is yet a great mystery to us after what manner, and on what these Wasp-Wormes feed within the Bodys of Catterpillars; the Anxiety of the Catterpillar in its change argued the troublefom Guest, it had in its Body.

Number. 50.

G. P. 1.
Tab. 58.

The *Catterpillar* of the 50th. Table : I for sometime fed it with *Elme leaves*, when it creeps, it is twice as long, as when it rests.

It changed the 9th. of *September*, and did continue in that condition untill the 24th. of *May*, the Year following, at which time came forth an odd shaped *Fly*.

This *Fly* is a very fierce enemy to *Spiders*, and by a singular antipathy persues and kills them ; whereas other *Flyes* are taken in *Spiders* webs and eaten by them : I have experienced that these kind of *Flyes*, whilst *Spiders* are in the middle of their *Nets*, and there expect the coming of *Flyes*, they seise upon the *Spiders* and wound them mortally ; the *Spider* himselfe thus wounded, cast himselfe upon the *Ground* by a thred ; this *Fly* follows, and breaks every leg of the *Spider*, one after the other, then he glories in a full *Victory*, and often goes above the *Spiders* body as it were rejoycing, I have Observed this thing thrice in doing, and then I saw the *Fly* carry away the *Spider* on its *Wing*.

This By-birth is an *Ichneumon* : That is, a *Wasp* with a slender body: its killing the *Spider* is very remarkable, and I have elsewhere (in the Philosophicall Transactions) Registered an observation of these kinde of *Wasps*, laying their Eggs within the cakes of *Spiders* Eggs, and that when Hatched, the *Wasp*-worms do feed upon the substance of the *Spiders* Eggs, and do inproesse of time, in the same *Spiders* webbs change into *Aurelia's*, and are thencc changed into *Ichneumons* of their own Species, from whence we learne the confidence of these kind of Insects : Which are secure from *Spiders*, and therefore may well
put

put other Insects, such as Catterpillars, lesse able to defend themselves, to what service, and use they please, making their Bodys Nurseries of their Young.

G.P. 2.
Tab. 25.

Number. 51.

The *Catterpillar* of the 51st. Table : Feeds of wilde *Aurach*, and is of the (*Green*) colour of the Plant ; its very slow in eating and creeping, and every way a sluggish Animall : It casts its skin like Serpents, or the Silkworme foure times, and had four severall shapes, upon its casting its skin, which happened thus, viz. When it had don eating, out of the body of the *Catterpillar* came a not-very-little worme, somewhat flat, and shaped like a *Flesh-maggot* : the worme crept forth the 12th. of *February*, about foure in the after noon, this Worme incessantly crept up, and down without eating or drinking for Fourteen Hours ; but in the mean time by little and little lost its colour, and its skin grew harder, for defence perhaps against the coolness of the aire and enemies ; and now creeping no longer, it rold its bent body, and put on an obscure colour, and then languishing, it seemed to fall of eating, but not greedily : the next day it seemed to Die, there being no signes of life, or motion in it ; but it continually rested till the later end of *September* : At which time came forth a *Fly*, rarely to be met with ; with longish legs, and flat feet : I believe this an *Amphibious* creature, and to live in the Water as well as in the Aire : this *Fly* had a great Head, of an unusuall shape, it laid mostly on its back, and therefore I have so *Figured* him ; he eat nothing that I offered him, and died the 3^d. of *October*.

It will be a hard matter, for any man to make sence of this History, and undoubtedly the diligent Author, had

much wronge done him, by the ignorance of the Lattin Interpreter, for to omit other things, what shall we make of the XXII. Calends. October. The truth is the Animall is very odly described, and Figured, it shou'd be a Waspe by all circumstances, and especially in that it has 4 Wings.

Again it cou'd be no Fleish-Maggot; because the Caterpillar was not carrion; but alive, at that time of the eruption of this Worme. The Author hints, a solution by thinking it an Anomalous, or Amphibious Creature. I affirme nothing, but that it was a By-birth; so the casting of Foure Skins is false.

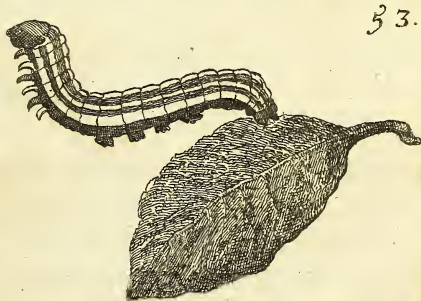
G.P. I.
Tab. 62.

Number. 52.

I cou'd find nothing that this *Catterpillar* of the 52d. Table wou'd eat, perhaps because he had left off feeding, and was ready to change.

He began very Anxiously to tosse and roule, turning and winding his body every way: by and by, there was an eruption of certain drops of water or sweat out of his, body all which drops, I saw change in the space of 12. Hours, into living *Catterpillars*. (*Erucas*) but they all perished with their Mother, for my want of knowledge of their food in one dayes time.

Its very frequent with our Author, to think that Dead which sensibly moves not: I am of the opinion that this By-birth were the wormes of an Ichneumon: And that these Wormes after eruption changed into Aurelia's: Which was perhaps the way they perished; compare this History, with the Cabbage Caterpillar above, History the 7th. of our method.





Number. 53.

I fed the *Catterpillars* of the 53^d. Table: with *Alder* and *Parretree* leaves from the 28th. of *May*: when it had Eaten enough, it fastned it selfe to the sides of a leafe, lifting up his head, at Sun set it drew in its head and slept all night; but some of these *Catterpillars*, will sleep 17. or 18. hours together, on the contrary others will creep up and down two Days and two Nights without food or resting; the hinder or lower parts of this *Catterpillar* Body are pellucid, they fight desperatly together some times; [*The Author left no further.*

G. P. 3.
Tab. I.

We have now done with all the greater sorts of Smooth Catterpillars, as well which the Author left us perfect, as the more imperfect Historys also. Here follow in the nex place, the lesser Species of Smooth Catterpillars, and we shall observe the same order in them, which we have done in greater, that is, first to range the more perfect and compleat Historys, where we find the Butterfly, and both the Disguises Figured.

Number. 54.

The *Catterpillar*, of the 54th. Table Feeds of the leaves of *Ragwort*: It is a Black and Yellow colour and smooth, in the month of *July*, it cleaves to Bents or Straws, and hides it selfe in a skin, for matter, like *Yellow Silke*.

After that I had fed him with the said herbes 8 Days, he changed the 24th. of *July*, and lay as dead in that condition, untill the 8th. of *May*, the year following, and then came forth a *Butterfly* partly Black, and partly Read, not unelegant, Figured in the Table: the *Butterfly*, retained

G. P. 1.
Tab. 9.

the colour of the *Catterpillar*, save that the Yellow in the *Catterpillar* was changed into Red in the *Butterfly*, it lived without meat 23 Dayes, and dyed after having ejaculated its Seed.

This Catterpillar is common and well known, I have had some of them out of whose bodies broke forth certain small Ichneumon Worms, spinning very white Foliculi.

G. P. 1.
Tab. 68.

Number. 55.

The small *Catterpillar* of the 55th. Table : Feeds on *Elder leaves*, and roles up those leaves like a Funnell, making it selfe a House in them against Raine, Sun, and Birds, and for this reason also feeds only in the night time.

It changed the 22 of November, 1657. And continued as is *Figured* in the Table, untill the 21st. of July, 1658. Then came forth a *Butterfly*, *Figured* also in the Table, very pretty and elegantly marked.

G. P. 2.
Tab. 1.

Number. 56.

The *Catterpillar* of the 56th. Table : Feeds upon the leaves of Winter Roses, but will not touch any flowers or leaves else, this is a nimble *Catterpillar*, and very sensible and crafty, I speak nothing but what I have seen and tryed. This *Catterpillar*, (as I have often tryed) wou'd not be moved at all, if the Winde blew the leaves it sate upon ; but if I moved the aire with my hand it wou'd immediatly cast it selfe down upon the ground, by a thred of its mouth, for to save its selfe from the fall.

A mongst the leaves, it feeds of, it is wont to make it selfe a House, elegantly knit of its owne Weaving and
in

in this it changeth, which it did the 20th. of *May*, as is *Figured* in the *Table*, and so continued untill the 12th. of *June*; then there came forth a *Butterfly*, which lived fasting to the first of *July*.

Number. 57.

G. P. 2.
Tab. 4.

The *Catterpillar* of the 57th. *Table*, is wont to feed of *Elme leaves*, it makes it selfe a pretty kind of Nest, fastning a thred to the one side of the leafe, and then to the other, and so brings both sides together, Knitting them close leaving an open passage at both ends; it creeps both backwards and forwards alike: If you touch it, it casts it selfe upon the ground swiftly by a thred, and do's Dart its Body swifter then an *Eale*, perhaps to strike terror into those Enemies that follow him.

I have two *Catterpillars* of the *Species*, one of them changed the 2^d. of *June*, as is *Figured* in the *Table*, there came forth a *Butterfly* *Figured* in the *Table*, the 9th. of *July*, which lived fasting 10, Days, I guess this to be a Male the other bigger bodied *Catterpillar* lived untill the 3^d. of *June*, it was full of little Wormes, which without doubt were the death of it.

As Wormes are the Death of Children, according to the opinion of both Antient and Modern *Physicians*; So 32. Little Wormes, broke forth of the dead Body of it: The 5th. of *June*, each of which Wormes as soon as out of the Body of the *Catterpillar*, fell to work and made themselves a Net, under which each made it selfe an Egg of its own Weaving. The 19th. of *July*, out of these Eggs came forth 32 little Flyes, which I kept alive a long time with Suggar: But at length I gave them their liberty suspecting that I shou'd else kill them, if these Fyes had been a little bigger, I had *Figured* them in the *Table*, but they were scarce visible.

These

These Flies were a By-birth, and undoubtedly Ichneumons, because they spun, as soon, as they came to light.

G. P. 2.
Tab. 7.

Number. 58.

The *Catterpillar* of the 58th. Table, are very noxious, and feed of tender Rose buds, they eat out the substance of the Bud, and do knit the leaves together very artificially, for shelter against the Sun : This Worm is from a fat juyce Hatched by the Sun and Dew : After long observation, and many unsuccessful tryalls (for this *Catterpillar* is not easily brought to change by our feeding) I found that it changed as is *Figured* in the Table : The 1st. of June, and was covered as with a white sheet, the 21st. of June came forth a *Butterfly*, which as soon as borne stood with erect wings, then it set a running swiftly with wings aloft, then it leaps up like a Grass-hopper, and at last rested quietly, it dyed within five Days for want of Food.

It is ill guessed of our Author, to think any thing can be begot of a fat juyce, &c. There is but one way, that of Animal Parents.

G. P. 2.
Tab. 9.

Number. 59.

The *Catterpillar* of the 59th. Table, feeds of Bramble leaves, they come of Eggs, Hatched the beginning of May, and lived upon the dry leaves of Bramble, by the *Butterfly* their Mother : For an Egg so layed, produced the *Catterpillar* *Figured* in the Table, which I fed as soon as Hatched with Bramble leaves, from the 6th. of May, untill the 3d. of June, when it began to change, making it
selfe

self a place to secure it self in, of laeves knitted toge
and then changed, the next Day, as is *Figured* in
Table : The 20th. of *June* came forth a *Butterfly*, which
new Hatched, lay like a dead creature, but by and by
flew like an Arrow out of a Bow.

*These Butterflies, are hard to be taken abroad, being of
a swift and cunning flight : they sit under the leaves when
weary : They abide cold well ; for I have also found them
in the middle of Winter under Bramble leaves, this But-
terfly lived 18 Days fasting with me.*

Number. 60.

G.P. 2.
Tab. 12.

The small *Catterpillar* of the 60th. *Table*, are ever
found almost within the Flowers, or Blossoms of the
Cherry, Aple or *Paretree*, and destroy much, and cannot
easily be driven thence, but by showers, they can endure
both heate, and cold, and well know how to defend them-
selves from the harme of either ; they knit and close up
the Blossoms they eat, and feed most in the coole of the
Evening or Morning, and that for 14 Days at least.

They are bread by a moist winde, and as soon as borne
do destroy, and eat the said Blossoms like a *Gangreen* ;
the watter out of which they are bread, is a moist cloud
like Honey dew, which by the scorching of the Sun, and
the native heat of the Trees, is turned into live Wormes,
which our *Dutch Boers* call *Woolves*.

The 18th. of *May*, this *Catterpillar* changed, and the
18th. of *June* came forth a *Butterfly*, quiet for two hours
after it was borne : which as soon as its wings were dry,
let fall one drop of water and flew away.

In the Morning you will finde of these *Butterflys*, sit-
ting on *Paretree* flowers, and sucking Dew thence, but
in Winter they hide themselves in Stables, and Grainaries
K. for

for warmth, they are very fearfull, and scarce fly away unless much urged : This *Catterpillar* was of old called by the *Dutch Boors* *De Woolfe*.

Our Author here also follows the vulgar opinion, as well as name, concerning the breed of these *Wormes* ; but his own Observation of the surviving of these *Butterflys* all Winter, were enough to evince the contrary, that they breed the *Wormes* : Compendious expedients to rid a *Fruit Tree* of them, were well worth the invention ; in the meane time, it is as well worth our pains, the picking these out of Blossoms betimes, as the weeding of *Corne* is. And my reason is, because they are bred but once in a season or about a time ; and therefore if you rid the *Fruit* once of them, the *Fruit* is secure of them ever after. But of these I purpose to say more in an other place.

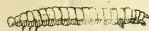
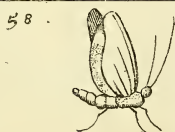
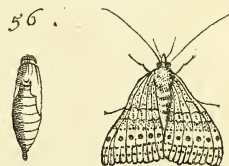
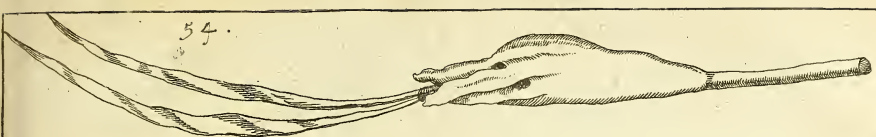
G. P. 3.
Tab. 13.

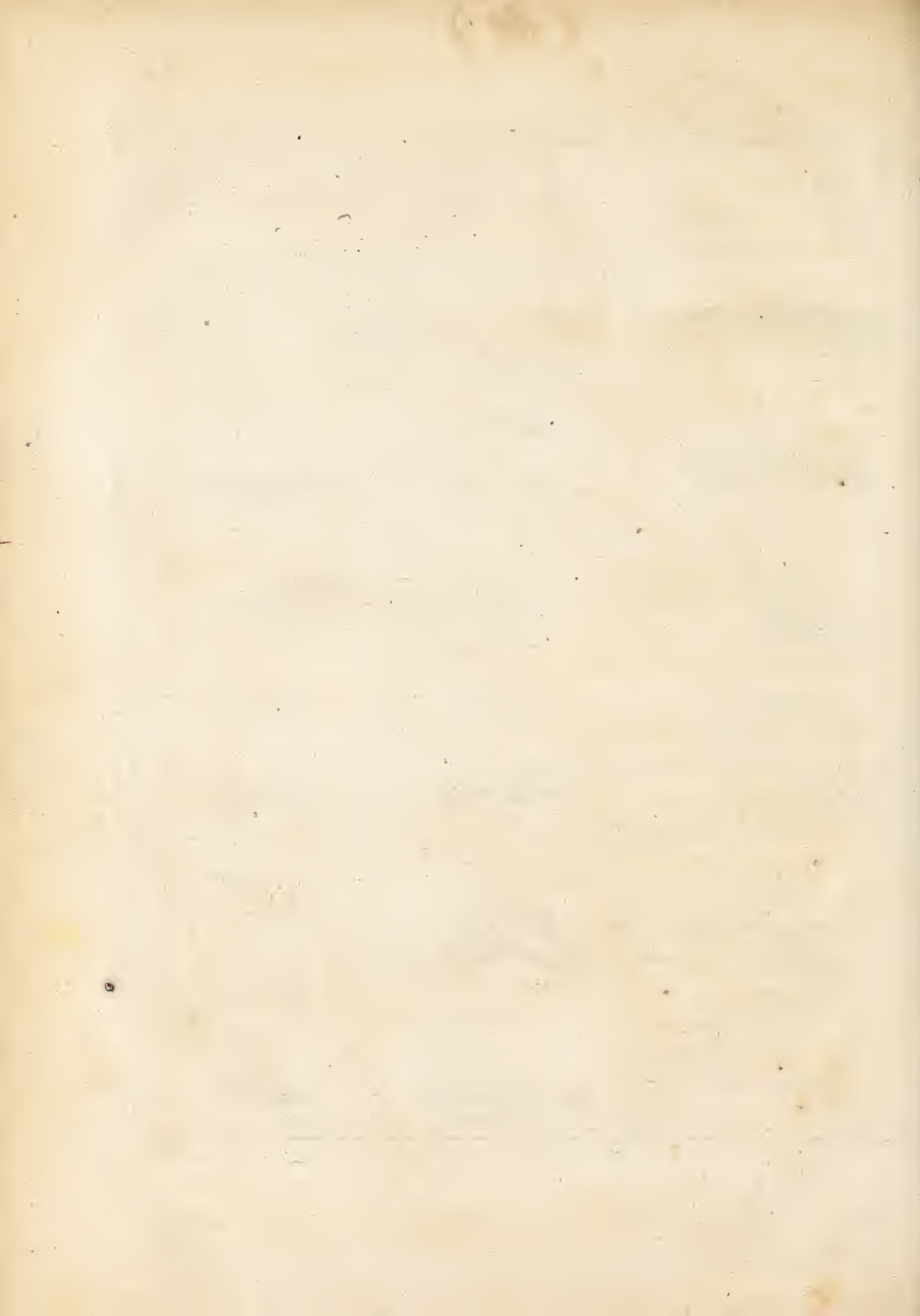
Number. 61.

The *Catterpillar* of the 61st. Table, feeds only on the *Herbe Calamintha*, it is alwayes wet, and leaves a shining slimy tract after it, where it has, crept like a *Snail* : its a fearfull and timerous *Animall*, and hides it selfe under the leaves of *Mint*, and often changes its station, it feeds ith night, but never ith Day time, and with its body in an erect posture, as one that is very circumspect and wathchfull to avoid danger : when it goes, it makes hast.

The *Titmife*, or little *Birds* (*Pari*) devower these *Insects*, and therefore they seldom appear, and are not to be driven from the places they hide themselves in, but by violence.

The *Catterpillar* Figured in the Table, abstained from meat the 1^{5th}. of *October*, and made it selfe a little house of sand and slime, and loosing its colour it changed the 26th. of *March*, as is Figured in the Table, and the 13th. of *June*, came forth a *Butterfly*, very notably marked with spots, which after 8 Days fasting dyed.





I conceive there is but little difference betwixt the Saliva of Insects, and that of Spiders, Snails, and Catterpillars, being very much akin. The reason why the Spiders and Catterpillars, forme the Thread of their Saliva, and the Snail not, is very probably, the Organ or Pipes, through which this juice passes, which are not given to the Snails.

Number. 62.

G. P. I
Tab. 72

The Catterpillar of the 62. Table, fed of the putrified Stone of a Mountaine Duck, and was bread thence, and lived in that Stone as long as any thing remained to feed on.

It change the 29th. of May, 1659. As is Figured in the Table, they undergo the like change in the Fethers of Duck, wrapt up and hid therein, that nothing but a little hole was left for the Butterfly to go out of.

The 7th. Day of June, 1659. came forth a Butterfly, or Moth Figured in the Table, this Moth is beautifull and delights in flying, wherein it uses strange motions and windings. These Moths live long unlesse they be taken in Spiders webs.

They shun the light and hide themselves in obscure places, and sometimes in Gardens, under the leaves of Plants: They feed on the sweet Dews on Flowers, as other Flyes; they hide themselves in winter in Houses, &c.

From this History, some have doubted whether the Catterpillar was ever perfectly formed before its change, but was rather borne after the change, because that untill the change it remained in the place of its birth, and took its nourishment there as Children do in the Womb, and Chickens in their Eggs.

The Butterfly living abroad in Summer, and returning into Houses in Winter, is enough to satisfy the manner of this Catterpillars birth, which is from the Animall Parent,

and not of putrified flesh, also it was in disguise in the rotten flesh, not as in the Womb, but as in a place where store of food was to be had; sutable to its nature, and for this the Mother Butterfly was Caterer; so that however the parts of the Butterfly are altered, from what they were, when in the disguise of a Catterpillar, yet do's the Buttersly retaine a sense of that meat, which she once fed off her selfe and do's not carelesly drop her Eggs; but there only where she finds sutable food for them to eat, as soon as they shall be hatched.

Here follows the less perfect Histories, of the lesser Species of smooth Catterpillars; that is to say; where either one or the other of the Disguises are not Figured in the Table, or a By-birth only instead of the Butterfly.

History. 63.

G P. 1.
Tab. 13.

The Catterpillar of the 63d. Table feeds on Thorne tree leaves as long as there are any to be had; it goes backwards and fore wards, as it pleases and that swiftly, when these Catterpillars, change, they get together into one place, and every one hangs by his own proper thread.

This Catterpillar, chauged by little and little, the 5th. of June, and the 27th. of the same Month, came forth a Moth Figured in the Table, which Moth haunts Thornes, and layes it Seed upon them which (spawn) hangs thereon untill the begining of the Year following, for Catterpillars appear not till there be food for them.

I have seen the change of this Catterpillar, (see my Notes.)
Numb-

Number. 64.

G. P. I.
Tab. 16.

The *Catterpillar* of the 64th Table, feeds of Sallow leaves, they shelter themselves from the Sun, in boughs and leaves knit together, they creep swiftly, and as soon as they perceive anything that is not usuall, and not familiar to them, they suddenly cast themselves down by a thred for their security.

This *Catterpillar* changed the 53th of June, and a nimble *Butterfly* Figured in the Table broke forth the 21st of the same month.

G. P. I.
Tab. 40.

Number. 65.

The *Catterpillar* of the 65th Table, feeds of the leaves of the *Ashtree* (which are Infested by this and many other *Animalls*) it very cunningly rowles up the leaves, and shelters it selfe against the Sun.

This *Catterpillar* purged it selfe and changed the 24th of June, and the 26 of September, came forth a Moth Figured in the Table.

Number. 66.

G. P. I.
Tab. 46.

The *Catterpillar* of the 66th Table, was bread in a *Sugar Pear*, and feeds thereof, it changed the 3^d. of August, and the Second of July, the Year following, that is, after a 11 Months (in which space it lay without motion or food, and as 1 thing dead) came forth a *Butterfly*, Figured in the Table.

We must think that Fruits, as well as leaves, are not the Equivocall Parents of any Insects : But the *Butterfly* only of *Catterpillars*, &c.

Not withstanding the opinion of Aristotles (de Plantis)
and lately of Signior Read, concerning Plantigenous
Animals.

*In the next place we shall range the Historys of the lesser
smooth Catterpillars, which are imperfect, that is where
there is a By-birth only, and no Butterfly Figured.*

7. P. 3.
ab. B.

Number. 67.

The Catterpillar, of the 67th. Table, greedily Eats the
the leaves of *Sallows*, there are great numbers of them :
Also these Catterpillars drink much and longe, especially
any sweet things: If you touch them, they defend them-
selves moving very swiftly the hinder part of their body.
this Catterpillar changed the 10th. of *Septembre*, 1663.
and continued so untill the 22 of *August*, 1664. And then
came forth a *Fly*, which lived fasting untill the 30th. of
the same month.

In the very middle of the change, is seen a black Egg,
to which this *Fly* owns its birth.

*This is the By-birth of some Flesh-fly, and our Author
is very diligent in that he has here, once for all, observed to
us, that he found, in the very middle of the Chrysalis of
the Eruca, the Chrysalis of the Fly ; which he calls a black
Egg : The Catterpillars Chrysalis was undoubtedly Car-
rion, and then Fly-blown.*

Number. 68.

G. P. I.
Tab. 28.

The *Catterpillar* of the 68th. Table, Eates the leaves of *Roses*, and I feed him also with the leaves of *Province Roses*, as often as I neglected to feed him; he prepared for change, but because that I had often observed that from an untimely change, ugly, miserable, and imperfect *Butterflys* came, therefore I gave this meat as long as he would eat, and that he willingly changed: He cleansed himselfe from all excrements, and changed the 14th. of *August*, and the 17th. of *June*, the Year following came forth a *Yellow Fly*, which is *Figured* in the Table, this *Fly* was slow and weak: This *Catterpillar* lay in the change, more then 10 Months, like a dead thing without motion and feeding.

Number. 69.

G. P. I.
Tab. 29.

The *Catterpillar* of the 69th. Table, delights to feed of the leaves of the *Red curran-tree*: That only when the Day breaks, after having quickly cleansed its body, it began to change the 12 of *July*, and continued in that condition untill the 14 of *August*, at which time came forth a *Fly*, *Figured* in the Table: A very swift *Flyer* but Dyed within *Foure Days*.

These two last are By-births, and of the *Waspkind*. being something more grosse and thick bodyed, then we usually find *Ichneumons* to be: however they are of kin, and I little question, but our Author might have found in these *Chrysalis's* the *Ichneumons Chrysalis's*; or the *Nimph's* of *Wasps* enclosed, if he had had the hap to have sought for them.

By the Figure of the *Catterpillars* they seem to be of one
and

and the same Species, and our Author not distinguishing betwixt By-births and such as are Genuine, he seems in some few places, to have multiplied Species unnecessarily.

G. P. 1.
Tab. 39.

Number. 70. A.

The *Catterpillar*, of the 70 A. Table, feeds on the leaves of the *Elme*, and is to be found on the very top of these trees: it leaps from place to place, like a *Grasshoper*: cold destroys it.

Having cleansed its body, it changed the 28th. of August, within a net which it had made before its changed, and which was as bright as Silver, it continued in the change till the first of June the Year following, about 9 Months, at that time came forth a Fly Figured in the Table.

This By-birth, is a Waspe, as appears by the Figure.

G. P. 2.
Tab. 8.

Number. 70. B.

This *Catterpillars* feeds of *Elme* leaves, their sleep extending 10 hours, and then cleanse and eat againe, when they are about to change, they let themselves down from the Tree by a Thread for safety, as soon as they come to the ground they seek a dry *Elme* leaf and having found one they creep into it, and Artificially Knitting it together close on all sides, covering their bodies besides with a silver coloured and bright Net: In this manner changed the *Catterpillars*, the 26 of May, as is Figured in the Table, and Four Days after came forth a Fly, Figured also to the life in the Table: It lived with me also fasting Six Dayes.

This

This is an other History, of the same Catterpillar, and this is a By-birth also; but a Flesh-fly, and Viviparous, if I mistake not.

Number. 71.

G. P. 1.
Tab. 48.

The Catterpillar of the 71st. Table. feeds of the leaves of the Cherry-tree, they are for the most part to be found under the leaves, shaded from the Sun.

This Catterpillar cleansed it selfe, and changed the 22^d. of July, and the 4th. of August came forth a Fly.

This By-birth (by the Figure) is a Waspe; having a short, thick body, and Four Wings.

Number. 72.

G. P. 1.
Tab. 49.

The Catterpillar of the 72^d. Table. eats the tender leaves of the Ash, leaving nothing but the skins; it is of a shining colour, as black as Pitch; it grows no bigger, then it is Figured: I called this the black Crab, because its hinder parts are like a Crab.

It changed the 28th. of July, and there came forth a Fly, Figured also in the Table.

This By-birth is a Flesh-fly, as appears by the Figure; and therefore we suppose the Chrysolys was Carrion.

Number. 73.

G. P. 2.
Tab. 2.

The little catterpillar, of the 73th. Table. eats the green leaves of Worm-wood; and its bred of a certain hu-

mour, as a seed, which some Mother Fly laid upon that Plant, Whence comes this *Catterpillar* : When it is newly hatched, it is of a white colour : When it begins to creep upon the ground, it forthwith makes it selfe a shelter, against the scorching heat of the Sun : After that it has once attained to its full growth, it is incomparable swift, and not easily to be taken, at the least noise it runs out of its shelter or lurking place to escape the Birds, it is then something like the colour of the Earth, it falls on.

When it begins to change, it gnaws in two a sprig of *Wormwood*, that it may the more conveniently knit it selfe therein a House, to change in.

This *Catterpillar*, changed the 4th. of June, as is *Figured* in the *Table*; the 9th. of the same Month came forth a *Worme*, which the 13th. of the same Month appeared in the shape of an *Egg*; out of which *Egg* came a *Fly* (Figured in the *Table*) The 26th. of the same Month; which in less then a quarter of an hour, became as big again, as when first hatched : I nourished this *Fly* along time with Sugar and Water; it made a wonderfull loud noise in flying, though but little of body.

This By birth, is a Flesh-fly, which are well known to fill a Room with noise, when they fly about it : Here are some unintelligible mistakes in the Latin Coppy.

G. P. 1.
Tab. 3.

Number. 74.

The *Catterpillar*, of the 74th. *Table*, eats the Leaves of the *Rose tree*; for the most part it feeds in the night only, for fear of *Birds* perhaps : It creeps slowly, and if touched, it slowly rowles it selfe up : When it is full, it stretches it selfe out as though it fell on : It made it selfe a House to change in, like a *lute* New, very pretty.

It changed therein (as is *Figured* in the *Table*) the 16th. of *September* : And the 14th. of *May*, the Year following came forth a *Black Fly*, which lived 7 Days fasting.

The By-birth here is an *Ichneumon*, as appears by the *Figure*.

Number. 75

G. P. 2.
Tab. 5.

The *Catterpillar* of the 75th. *Table*, would eat nothing but a certain *Rush* or *Grasse*, growing on the Banks of *Ditches* : It fed but slowly, and crept as slowly after it had done feeding, and when it was full, it was a third part less, then in the time of its feeding.

The 2^d. of *June*, came forth of this *Catterpillar*, a *Worm*, out of which *Worm*, the 9th. of the same Month came a *Fly*, which was so very small, that I could not *Figure* it in the *Table*.

This *Catterpillar* changed in the forme of a *Tobacco-Roll*, as is *Figured* in the *Table*.

The 1st. of *August*, came forth thence a *Fly*, whose wings were so clear and *Transparent*, and clapt so close to its body, that it seemed to be without wings : This *Fly* was like a great *Pismire*, and ran swiftly, and not with *Expanded* wings, but with them clapt close to its body, it lived with me fasting 14 Days.

It is rare that one *Catterpillar* should nourish two By-births : but this *History*, seems to be an instance, that it is so, and that both of them are *Ichneumons*.

Number. 76.

G. P. 2.
Tab. 6.

The small *Catterpillar* of the 76th. *Table* eats *Columbine* leaves, and cleaves so fast to the edges of those leaves,

that you may sooner pull them in pieces, then take them off: they eat like a spreading *Cancer*, what ever Plant, be it *Roses*, &c. they light on; for the most part you find them great and small together; they are just of the colour of *Columbine leaves*: they fear no weather: touch them and they vibrate their tail wonderfully.

This *Catterpillar*, changed the 8th. of *June*, as Figured in the *Table*: And the 21st. of *June*, came forth a *Black Fly*, Figured also in the *Table*; these kind of *Flyes* I have often seen sitting upon *Bryonie*, (*Vua. ursina*.) lived two Days without meat.

This By-birth is a kind of Flesh-fly; and the Chrysalis is the change of a Flesh-fly; and therefore here is some escape in the observation.

G.P. 1.
Tab. 64.

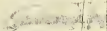
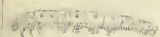
Number. 77. a.

The *Catterpillar* of the 77th. *Table*, Marked *a*. eats but once a Day, and that sparingly, the leaves of *Sallow*, and when it has done eating, it rowles up its body in a round, like a (*Snake*) dog, and then about noon the next day a little more food, and then to rest in the said posture: this I observed it to doe (and it is a most wonderfull *History*) untill the last day of *September*, 1653. and it rested without changing the posture of its Body, or moving untill the 24th. of *October*, 1655. I touched its body daily with a little Feather, that I might certainly know whether it was a live or no, and I observed it alive, and at every light touch to move and contract its body, two whole Years and 24 Dayes, and that without any food, or so much as locall motion, I saw no change in it, but that its body through long fasting was manifestly lessened.

Num-

63

64

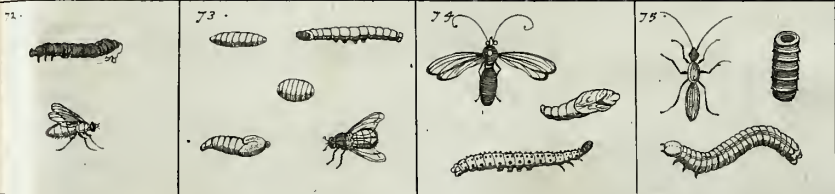
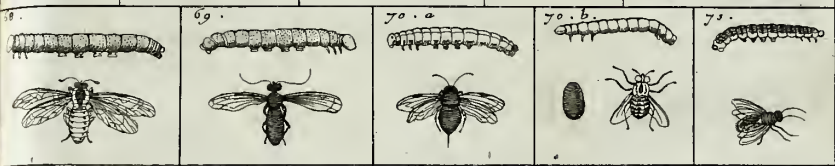
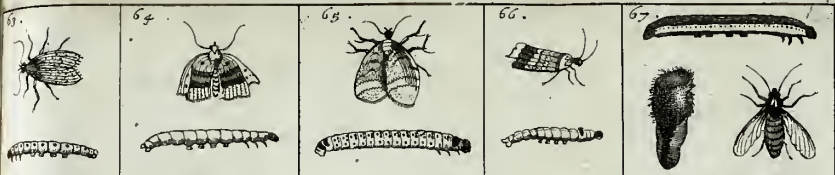


65



66







Number. 77. b.

G. P. 2.
Tab. 17.

The *Catterpillar* in this 77th. *Table*, fed for most part on *Columbine*, and some times on *Rose leaves*; when full, it roled it selfe up like a *Hedg-hog*, as is *Figured* : I kept some of these *Catterpillars*, some whole Years, formerly by me, and fed them, but they constantly dyed without changing: without doubt, because somthing was wanting necessary to their change; which thing when I had thought on, I shut one of them up in a *Glass Violl*, filled with Earth and fed it therein, after a while, I found that it crept within the Earth, and that he made himsele a large House in the bottom of the *Glass*, by the slime of his mouth, Arched over head, and covered himsele with Earth, that he seemed a lump of Clay, and thus he did, as I gues, for safety : Also within this Earth, he knit himsele a Net for yet greater safety.

The 27th. of *July*, this *Catterpillar* rested in order to its change, as is *Figured* in the *Table*, and remained therein 7 Days without stirring, the 5th. of *August*, came forth a *Fly*, and the day after another *Fly*, both which after they had rested a little while, did couple in order to the propagation of their *Species*.

I have often seen these *Flys* lay their seed upon the leaves of *Columbines*, which is a Green and fat juice, and so small, that one must have good Eyes who discernes it.

These *Flys* I fed for some time with Water and Hony, at length depriving them on purpose, of their Water, they Dyed.

This is the 3^d. time our Author has made two Histories of one Animall.

Here are indeed many things worth nothing, and difficult

cultly explainable: In the first History, the long suspending its Change, even for above two Years, is very remarkable. In the Second History, the diligence of our Author, in supplying it with Earth is very commendable.

Again the two By-births are Ichneumons, as appears by the Figure: Their coupling is extraordinary; the Author, never yet having observed it; though some Scores have been born together.

He also tells us of the Seed or Eggs of these Ichneumons, which he says (from frequent observation) is extremely small, not to be seen, but by very good Eyes, but that I suspect an error in this observation, (this fat and Green juice, may rather be an excrement than Eggs) I shou'd think that possible the Ichneumons Flys Eggs, may be licked up, and swallowed down by Caterpillars in feeding, and escape digestion, and hatch within the Caterpillars body: but I affirm nothing, not having yet seen the Seed, or Eggs of any one Ichneumon layd.

Hitherto of the smooth Caterpillars, both small and Great: In the next place we shall Range the Histories of the Hairy Caterpillars.

G. P. 2.
Tab. 29.

Number. 78. a.

The Caterpillar of the 78th. Table, marked a. feeds on Alder leaves, I nourished two of them, to see what wou'd come of them; the one was a little brighter coloured, then other.

One of the two changed as is *Figured* in the *Table*, the 15th. of *June*, and the 15th. of *July*, came forth a *Butterfly Figured* in the *Table*, very brisk and sportive, I kept him alive 12 Days.

I had a Third of these kind of *Catterpillars*, which seemed to be sick, it had no stomach to its meat, and its *Hair* trembled, as though it shook with an *Ague*.

It not withstanding changed (just as the first is *Figured* to have changed) the 20th. of *June*, and out of that change came forth a *Fly* the last Day of *June*; *Figured* also in the *Table*: This *Fly* was very nimble in running, and very sportive with its Wings and Hornes, it eat Honey exceedingly, and immoderately, I let it goe, now well knowing to what it owes its *Birth*, and what comes of its Seed layed upon *Alder leaves*, and Hatched by the heat of the Sun.

Number 78. b.

G. P 2.

Tab. 30.

The *Catterpillar*, Companion to the first, (and of which we said came of *Butterflys Figured* in the *Table*,) changed the 19th. a *June*, just as *Figured* of the change of the first.

The 2^d. of *July*, came forth a wonderfull *Animall*, without Wings, having the hinder part of its body very thick, and full of Eggs, and covered with a thin skin, so that the Eggs were almost visible through it, the Day after its Birth, it layed all its Eggs, and having that thin skin of its Tail, full of Down or Wool, like the *leaves* of *Moth Mullein*, it pull'd off that Down, and covered its Eggs with it, for security, and then when it had emptied it self, there was little left it, but the forepart of its Body and Leggs, and it appeared then much like a *Spider*: it lived fasting 18 Days. The very day that it Dyed the Eggs were hatched and the little *Catterpillars*, crept about, I suffered them to provide food for themselves, not being

being willing to be troubled with the feeding of them, especially knowing what they wou'd come to.

Note that all that is related in the 1st. History, is agreeable to our observations, there being an Ichneumon from the Chrysalis, of an Eruca: also besides the By-birth, there is the Butterfly, viz. The Genuin and Legitimate off spring.

In the 2^d. History, there are two things very singular: The First is the birth of a Monster, or a Butterfly, without Wings, this I say is no By-birth,, but a Monster in Nature, such as the birth of a Bird wou'd be without Wings. The Second is yet more wonderfull; that this she Monster should lay her Eggs (which thing is common to all the Butterfly kind as soon as born) without the copulation of a Male, and that (which is most remarkable) these Eggs shou'd be Hatched, that is Proliffick, without the Male, (Vid. Ma'pigium de Bombyce) where one of the best observations in that piece is the change of colour in the Eggs, of such Females as have admitted the Male; and that such Eggs as are layd without the admittance of the Male, doe not change into that colour, and are not Proliffick; This I can affirme that I had a Butterfly which layd her Eggs in a Box, and that these Hatched therein after a certain time, but whether the Butterfly had admitted the Male before I took her, I cannot say.

G.P. 1.
Tab. 59.

Number. 79.

The Catterpillar of the 79th. Table, feeds upon Plum-tree leaves, it is a wonderfull Figure, on the back it has Four Yellowish Brushes, or Tufts of hair, out of the Fore-head grow two other Tufts, like Snail hornes, on each side are two other Tufts like Oars, the one Black, the

the other Yellow, on the hinder part of the Body they look like Feathers; but all is Hairy; it *changes* its skin with great anxiety, wiping its sweaty Body with the Feather-like tufts: all the Day, after the shifting of its skin, it rests without food; and all its body is very tender and soft.

After it had cleansed it self well, it change the 20th. of June, and abode in it untill the 30th. of the same Month, and then came forth a wretched creature, neither *Butterfly*, nor *Catterpillar*: the reason of the defect was, that it abstained from meat before its time, its Body not being arrived to that perfection, requisite to its change.

The Authors words must be favourably interpreted, for it is plaine in the Table, that the Animall was a Butterfly; but as he well notes a starved thing; many of which I have had, whose Wings were yet imperfect, or at least not in a condition to be expanded.

Number. 80.

G. P. I.
Tab. 36.

The *Catterpillar* of the 80th. Table, is found about the Sand hills, along the Sea shore, where it feeds of various Herbs but I could not find one Herb that it wou'd eat off: upon the back of it grows Five Bunches of hair, two upon the head like Hornes, and one upon the Taile; and out of these Bunches grows some Haires longer then the rest, as ornaments: I forthwith designed this *Catterpillar*, because it hastened to *changed*, making a web for it self of its own Hair.

It changed the 10th. of July, and the 8th. of August came forth a *Butterfly*, which as soon as borne hid (as it were) its eyes with its fore feet, as not being yet able, to endure the light.

Number. 81.

G. P. 3.
Tab. S.

The *Catterpillar*, of the 81st. *Table*, was taken in an *Apricock tree* : And sent to me from *Bergenopsone, &c.* After I received it, it wou'd not feed, but changed the 7th. of *October*, 1664. And the 2^d. of *May* the year following came forth a gray *Butterfly*, which so covered with its Fore-feet the whole Head, that it was not to be seen. It seemed to be a Female from the heaviness and thicnesse of its body : It lived fasting 10 Dayes, and before it dyed, it layed many Eggs ; but which for want of the Seed of the Male were not *Fecund*.

How much this opinion, of Infæcond Eggs agrees with the Observation of the 78th. History, Let others Judge,

G. P. 1.
Tab. 50.

Number. 82.

The *Catterpillar*, of the 28th. *Table*, feeds only of a certain *Grasse* ; it sleeps in the Day time, but its night is in perpetuall motion, its very thirsty, when it drinks, it dips its Head in the water, and lifting up the forepart of its body, it drinks like a Hen, often sipping.

When it had cleansed it self, it changed the 7th. of *June*, and abode so untill the 3^d. of *July*, and then came forth a *Butterfly* ; a pretty big one, of a yellowish colour, marked with a red Line cross each Wing, as *Figured* in the *Table*.

G. P. 3.
Tab. G.

Number. 83.

The *Catterpillar* of the 83th. *Table*, wou'd eat nothing that I gave it ; it is a slow goer, not unlike that slow
paced

paced *Animall* , well known to the *West Indians*, by the Name *Haut*: It was wont to wipe and cleanse its whole body, with a dark coloured Feather on its taile, and likewise defend it self with the same, if touched: It is very quiet, before its change; it *changed* the 2d. of *October*, 1663.

It composed it self for change thus : It first made a Net, round about its body, of its own juice ; and within that Net another, yet lesse and of a finer thread ; which touched not the outward Net, but hung like a Bell in it, and was so thick and compact that no body cou'd see through it ; and within this it changed.

The second of *May*, 1664. Came forth a lusty *White Butterfly*, I stuck him throw with a pinn, that he might not Dissipate its excellent Whitnesse, and so he lived 4 Days.

Number. 84.

G. P. 2.
Tab. 50.

The *Ruff Catterpillars*, of the 84th. Table. Eats greedily the green leaves of the *Artichoke* plants ; and when its belly is full, it creeps into the Earth.

This *Catterpillar* put off its skin the 30th. of *August* : and fasted, untill the Haire was grown again, and that it cou'd eat ; that is for foure or five Days, sooner or latter.

The 9th. of *September*, it changed, as is Figured in the Table.

The 1st. of *May* the Year following, came forth a *White Butterfly*, which never moved for two Days ; but then grew wild and furious ; and at length dyed for want of Food.

Number. 85.

G. P. 3.
Tab. H.

The *Catterpillar*, of the 85th. Table, eats *Alder leaves* ; all its body is Rough and Hairy ; if you touch these

Hairs, it Vehemently strikes its Head with its Tail; in one Night it lost all its greenesse, and became wholly Black: I cou'd well see a *change* of colour with my Eyes; it shook the Haires and moved them with a notable force, and cleerly without *changing* at all its skin.

It changed the 6th. of October, 1663. As is Figured in the Table.

The 30th. of June, the Year following, came forth a duskyish coloured *Butterfly*, marked with white spots, as is Figured in the Table: It lived untill the 10th. of July.

G. P. 3.
Tab. D.

Number. 86.

This *Catterpillar*, of the 86th. Table. creeps swiftly from place to place, and eats almost any kinde of Herbs, *Trefoile*, *wild-time*, *Elme*, and *Willow leaves*, and many others; and yet most other *Catterpillars* will starve before they will feed of any thing, but their ordinary food: For colour it was of a shining jett Black: if touched, it rould it self upround like a Ball.

It changed the 13th. of September, 1663. And the 25th. of May, the Year following, came forth a very beautiful White *Butterfly*, having its body distinguished, with three rows of Black Spots; it lay without motion.

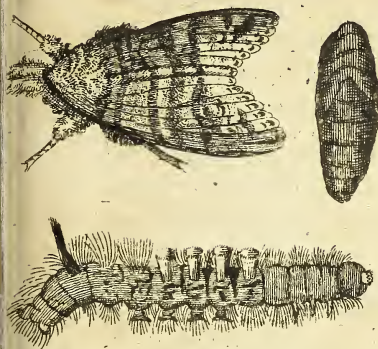
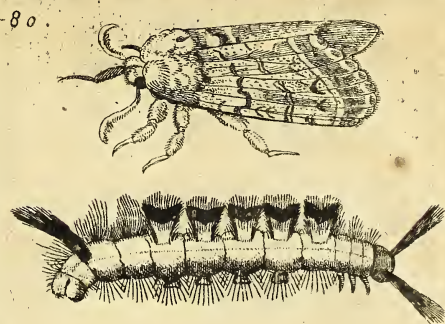
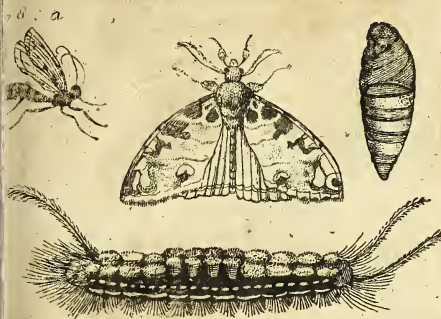
It is worth Noting, that from a Cole black *Catterpillar* that had no White, but about its mouth, there shou'd be born a *White Butterfly*.

From another of the same *Species* of *Catterpillar*, the 13th. of June, 1664. A Long Legged Fly came forth, which lived not above one Day.

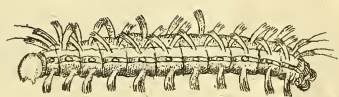
G. P. 1.
Tab. 3.

Number. 87.

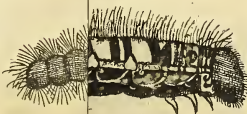
The *Catterpillar* of the 78th. Table, feeds on *Poplar*, and *Willow leaves*, which two are of a like nature: These *Catterpillars*



84

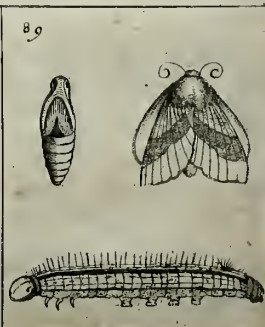
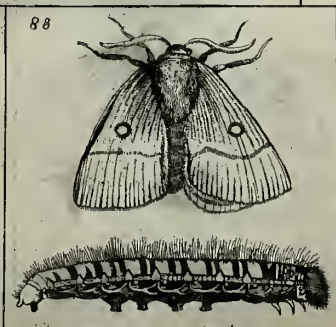
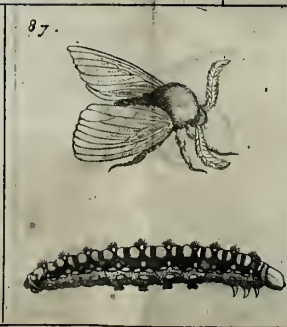
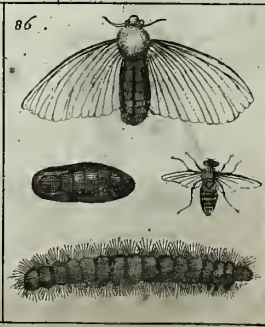
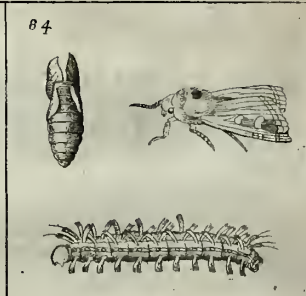
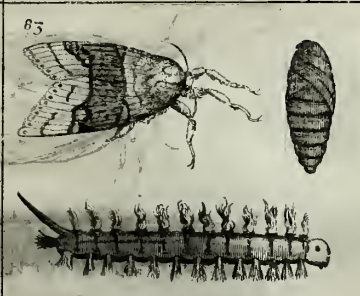
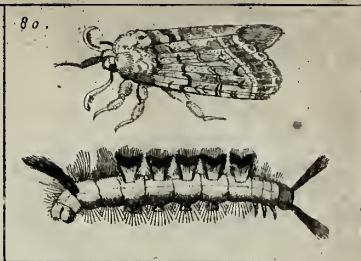
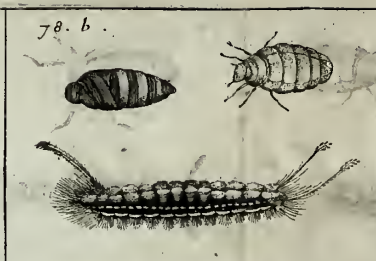
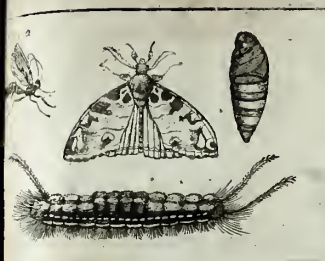


86.



89







pillars come of a Seed, as most do, which did stick to the *Poplar leaves*, they are seen a far off, abiding in the tops of those Trees, because of their notable whiteness, *Figured in the Table.*

It changed the 6th. of *June*, and continued so 14 days, and then came forth a *White Butterflys* *Figured in the Table.*

The *Butterfly*, laid its Seed after some Dayes time, and lived, without food, 24 Days.

G. P. I.
Tab. 7.

Number. 88.

The *Catterpillar* of the 88th. *Table*, Feeds upon the leaves of *Brambles* and *Oziers*.

It changed the 13th. of *June*, and so remained untill the 14th. of *July*, and then came forth a dark coloured *Butterfly*, *Figured in the Table*: It is of a brownish colour, upon each wing it has a round white spot; I found it dead after two Days, though it seem'd to be of a strong nature.

Number. 89.

G. P. I.
T. 10.

The *Catterpillar* of the 89th. *Table*, feeds of *sallow leaves*; which are dry and astringent, and therefore it drinks much; which are singular to it; for almost all others eat green leaves, and drink not.

Its birth is from a Ring of little Eggs, cleaving so Tenaciously to the tender twiggs of trees, that it can scarce be gotten off, but with a Knife; these Eggs abide the sharpest Winters, and are hatched by the heat of the Sun in the Spring, when the leaves put forth, that their meat may be ready for them, as soon as born.

This *Catterpillar* changed the 2^d. of *June*, and continued so untill the first of *July*,; and then came forth a *Butterfly* *Figured in the Table.*

It dyed after it had layd its Eggs; but the Eggs dried, for want of having been besprinkled with the Seed of the Male.

Observe the *Elegant Posture of the laying of the Eggs, of this Butterfly ; in the fashion of a Ring, Circling a Twig ; as for their being in facund, for want of the Male, it agrees not with other, this Authors Observations, as is above noted.*

G. P. I.
Tab. 13.

Number. 90.

The *Catterpillar*, of the 90th. Table, feeds on *Haw-thorn leaves*, and *Pear-tree leaves* : As soon as *Autumne* comes, they gather together, and *Club for a Web* ; for that purpose they knit together the tops of the yet. tender boughs with their leaves ; and therein preserve themselves, as soon as the weather is favorable to them, that is about the beginning of *Aprill*, they begin to eat againe ; they leave a *Hole* open, out of which they may goe and come in againe ; in cold weather they exactly shut that *Hole* : *Rain* never stands upon the web, but slides off, as though it was greasie : *Titt-birds*, eats them greedily.

This *Catterpillar*, changed the 2d. of *June*, and the 30th. of the same Month came forth a *White Butterfly* marked with a *Red spot* on each wing.

G. P. I.
Tab. 13.

Number. 91. b.

The *Catterpillar*, of the 91st. Table, eats *Haw-tree*, and *cherry-tree leaves*, &c. It is wont to ly under the shade of the leaves ; as hardly induring the heat of the Sun.

Before it changed, it cast its skin thrice, each time, resting on eay until its Head hardened, for immediatly after its skin casting, the Head, and all the Body is soft, and weak ; and by little and little grows stronger and hardens.

It changed the 12th. of *June*, enclosed in a Bagge, as is *Figured in the Table*, : And the 4th. of *July*, came forth an elegant *White Butterfly*, *Figured in the Table*.

Number.

Number. 92.

G. P. I.
Tab. 22.

The *Catterpillar* of the 92d. *Table*, feeds on the leaves of *Cherry*, *Pear*, *Plums*, and *Almond trees* : I could never find the seed it came off: It is admirably beautifull in the variety of colours ; when it is first Hatched, it is like a little *Snail*, moist, Glutinous and shining ; then it waxes by little and little, untill it casts it skin, and then appears its colour, and after that it again and again casts its skin.

It changed the 22d. of *September*, in leaves Knit together ; and the 12 th. of *July*, the Year following, came forth a *Butterfly* Figured in the *Table*, ; it lived, but two Days, though it had laid 9 Months, and 20 Days in the change.

Number. 93.

G. P. I.
Tab. 23.

The *Catterpillar* of the 83d. *Table*, eats the leaves of *Labrusca*, (perhaps *Bryonie*) although with the smoak of that Herb *Mice* are said to be killed: They eat not, as I have experienced of the Herb, before its *Berryes* come, and then they feed on the leaves untill the *Berries* grow Red and fall off; and then the leaves seem no longer fit to nourish them,

This *Catterpillar*, changed the 24th. of *September* ; it continued in its change untill the 13th. of *June*, the Year following, because *Winter* came on ; and Flowers out of which *Butterflys* take their food, began to faile: the 13th. of *June*, I say came forth a *Butterfly*, a of Yellowish colour, Figured in the *Table*.

Here the reason of the Noneruption of the *Butterfly* all winter is, well assigned, to be the want of Food, and the approaching cold.

Num.

G. P. I.
Tab. 32.

Number. 94.

The *Catterpillar*, of the 94th. Table, We fed with *Tobacco leaves* only; and it loves those leaves, which are largest and dry; and the smaller moist, and tender leaves, in the Wings of the greater, he cares not for.

He having cleansed his body, changed the 3^d. of *August* and the 17th. of the same Month came forth a beautifull *Butterfly*, which is wont to haunt Garden flowers; puts along sting into them, and is swift of flight.

This Butterfly is frequent in July, to be Observed when July Flowers are in their prime; but is difficult to be taken by reason of its sudden and swift flight.

G. P. I.
Tab. 34.

Number. 95.

The *Catterpillar* of the 95th. Table, in great numbers eat *Ozier leaves*, it is of an elegant colour, viz. Yellow distinguished with Black lines, as is *Figured* in the Table.

It changed, the 8th. of *August*; and the Year following came forth a *Butterfly*, *Figured* in the Table. Of a Robust Body, and yet it lived but two days.

Of this also see my Notes.

G. P. I.
Tab. 38.

Number. 96.

The *Catterpillar*, of the 95th. Table, delights in *Ozier leaves*, as many others do; to me the reason seems to be the dry temper of them; which corrects the moisture of

of *Catterpillars* If touched, it coyles up its body, like a Ball; but you may put him out of that fearfull fit.

After it had well eaten, and well purged its body; it changed the 10th. of *September*; and the 10th. of *June*, the Year following, came forth a *White Butterfly*, marked with Black Spots upon the wings.

Number. 97.

G. P. I.
Tab. 63.

The *Catterpillar*, of the 97th. Table, eats *Rose leaves*, and *Clary*: It changed the 20th. of *July*, as is *Figured* in the Table; the 2d. of *August*, came forth a various colored *Butterfly*, which I kept alive a while with Hony.

Number. 98.

F. P. I.
Tab. 8.

The *Catterpillar* of the 98th. Table, eats divers Plants, and are found upon the Sand-hills; it changed the 12th. of *July*, and the 5th. of *September*, came forth a *Butterfly*. *Figured* in the Table: This *Butterfly* was tender and weak; which I took to proceed from the *Catterpillars*, being deprived too early of its food.

We found this Catterpillar, on the Sandy Downs above Calice: See my Notes.

Number 99.

G. P. I.
Tab. 17.

The *Catterpillar*, of the 99th. Table: Willingly feeds on *Lettice* and *clary leaves*; it is very Hary, as soon as it perceives any thing unusuall to it, it rowles it selfe up,

like a Ball, and moves not : It sets up its Bristles, like a *Hedghog* ; and if you take hold of its Haire, it easily suffers them to be pluckt off.

Sparrows, and other Birds eat not these *Catterpillars* ; but seem to abhor them, whence some guess they are poisonous.

It changed the 30th. of *June* ; and the 22d. of *July*, a large and beautifull *Butterfly* came forth marked with divers colours.

These *Butterflies* lay their Eggs before winter ; and because the *Catterpillars* are hatched late, about *October*, they therefore hide themselves in the Ground, chinks of Walls, and in other places, and live without food, untill the beginning of Summer, as I have had experience.

G. P. 2.
Tab. 23.

Number. 100.

The *Catterpillar*, of the 100. Table, eats the leaves of *Earth Nuts* ; with which I kept him long : After his belly was fallen (perhaps for digestion sake) he ever crept long about the Glasse, I kept him under.

It changed the 3d of *August*, as is *Figured* in the Table, the 2d. of *June*, the Year following, came forth a *Butterfly*, to which I never saw the like ; Its wings were as White as Snow, its Body Yellow, and bright ; it flew swiftly ; first clenning its body of a certain humour ; it dyed after 5 Days keeping under a Glass, where it seemed to have been stifled, for want of a free Aire.

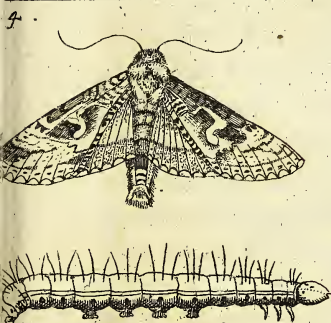
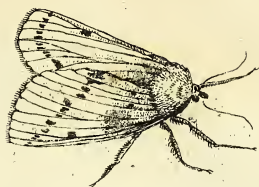
G. P. 2.
Tab. 26.

Number. 101.

The Hairy *Catterpillar*, of the 101st. Table, eats willingly the leaves of *Heliotropium*, as its usuall food : They fight amongst themselves desperately, and make the
Hiare

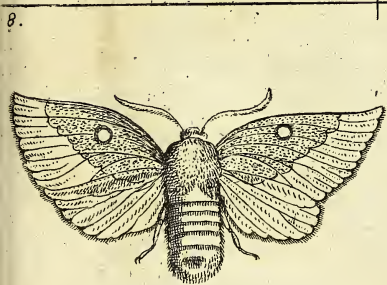
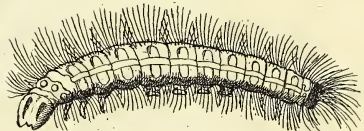


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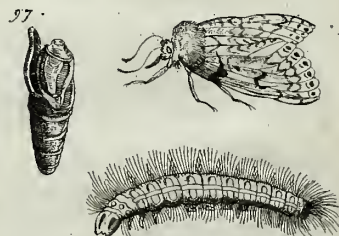
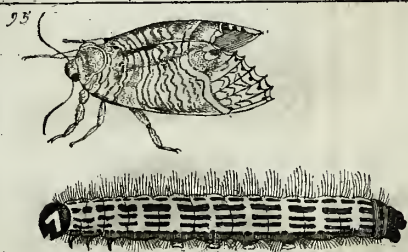
95

97.



102.







Haire Fly: They are very fearfull, and rowl themselves up when touched, sleeping *Doggs-sleep*.

It changed as is *Figured* in the *Table*: The 10th. of *September*, in a bag of leaves knit together; the 10th. of *June* the year following, came forth a *Butterfly*; which seemed to sleep ith *Day*, but was very swift and nimble ith *night*, Bat like: I let it go, not knowing, how to keep it.

Number. 182.

G. P. 3.
Tab. N.

The *Catterpillar* of the 102d. *Table*, having had its fill of *Ozier leaves*, betook it self to a corner for change, as I thought: But instead of that I Observed a *Green Worm*, to break forth of each side its body; this was done with great anxiety, and contortion of its Body: The first Worm, as soon as borne, fastned upon the wound, it came out off, and suckt up all the juice, and substance of the Mother *Catterpillar*; so that nothing but skin was left: The other Worm through the firsts greediness, being destitute of all food, dyed in the wound, out of which it was coming: Whose body also, the Mother being evacuated, was consumed and drawn dry by the first Worm. This first Worm being now satisfied, with the Bodies of Mother and Brother, rested moveless, and without any other food, untill the 15th. of *October*, 1664. And then changed into a Black Egg: The 18th. Day of *May*, the Year following, 1665. Came forth two *Flys*, One of of which is *Figured*: in the *Table*, in which *History* it is worth nothing: That of one Egg came two *Flyes*; that by this meanes, the losse of two Worms, might be restored: Which as I said, did make up the body of one.

Thus we have done with all the Historys of Butterflies, I find in all the industrious Labours of Johannis Goedartius: I sho uld not question the truth of this last Histo-

ry, nor of the Faithfullness of the Translator. Mey being every where as modest, as the other is bold and impertinent: I am willing to confess that this is the only puzzel which I have yet met with in all the experiments of the Author; yet it may be, that two Ichneumon Wormes, might club for a common Foliculus; which he calls a Black Egg, as well as five, as in the 20th. History, above to be Noted. and yet that is, but a bare conjecture of mine, and which this History (to say the truth) dos not countenanc; for it sayes, that one Worme only, was remaining alive, which changed, into this black Egg.

Thus also you see the Butterfly kind, takes up near two thirds of the Book; but yet this was not the Authors choice, but his chance: which will appear, to him who shall consider that this kind of Insect, is for the most part laid, Hatched, and sed openly, and obviously upon Herbs, and Trees: whereas the nestling, education, and food of most other kinds of Insects, whilst in Embrio, and in their severall disguises, is in darke and secret corners of the Rocks, or within Trees, and Plants, or under ground, or at the bottom of Lakes and Rivers: So that, unless diligently searched for, they are not easily to be found.

Section. 4.

Of Butterflies with Transparent wings, known by the name of Draggon Flyes, in English.

There is another kind of Insect, which the Ancients have left nameless: the more modern Authors, have called them Libellæ, Perlæ, &c. These Insects I reckon among the Butterflies, at least for some affinity betwixt them, I put them

them nex after them: they all have Foure Wings, fliffe, brittle, and Transparent; they are of a fierce nature, and pray upon Flys, which they take in slight, as Hawks do the little Birds: Some perhaps may think better to put them after, or next the Beetles; because the Worms of both are Hexapod: our Order wille agree well enough with both; and it is sufficient that we do not confound them; as being a peculiar Tride of Insects of their own kind.

Number. 103.

G. P. 3.
Tab. R.

The Hexapode Worms, of the 103d. Table, when first Hatched are very small, like Gnats; but in time grow great: They are found in Ditches, and have no other food; then that the greater feed upon the lesser; in a very short time I saw one of the three Large ones Figured in the Table, devour six Lesser ones of the same Species: Hence it is, that these creatures are wonderfull timerous, for if a Lesser meet a Greater they fly a way with all the speed possible, but in vaine.

I find no more amongst the Authors Papers, but that of one of the Hexapode worms Figured in the Table, a Sky colour Winged Insects; Figured also in the Table, was produced; but I find not any one circumstance of the matter of the Change.

Number. 104.

G. P. 2.
Tab. 14.

The Hexapode worm of the 104th. Table would not eat neither Bread nor Meal, nor Sugar, nor divers Herbs which I set before it: Nor would drink water: I then bethought my self of giving it to eat dead Pismiers
N 3 *Beetls*

Beetles, and other dead *Insects*; I therefore put it up with a dead *Beetle*, into an *Ivory Box*, having learnt by experience, that these kind of *Insects* will perforate *Wooden boxes*; this *Beetle* it fedd on eating out all its bowels, and creeping into the shell of the *Beetle*; wherein it wou'd conveniently turn it self about every way: This *Worme* is slow footed: its an angry creature, and bold; keeping its station, unlesse you vex it overmuch: It hath a painted Taile, which is shining, with which it defends it self, that it cannot give back, and then it contracts its body, and with its toothed *Forcipes*, it strongly defends it self, against any violence done to it.

This *Worm* lay in the body of the *Beetle*, it had fed on, from the 18th. of *August*, untill the 8th. of *June*, the Year following; then out came a winged *Insect*, beautiful, and elegant. The wings were very remarkable, but so tender, that I could scarce draw them with a *Pencill*, and shining bright as *Mother of Pearl*. Its two eyes glisterd like *Gold*; its body was of a *Sea-green* colour.

He flew with his head erected, and the rest of his body hanging downwards, with his wings spread, but not agitated; which perhaps he cou'd scarce do, as I guess from the bigness of them, but was carried by the Wings through the Aire, he lived but two Days fasting, for I knew not what to feed it with.

In the 5th. SECTION, we put the Bee-kind, which have (as all the former Insects) Four Naked Wing.

Section. 5. of Bees

Number. 105.

G. P. 2.
Tab. 46.

You have one of the great sort of *Bees*, (called *Bombi-liz*, by the *Greek*) Figured in the 106th. Table.

This *Bee* chooses mostly a deep and dry soyle ; to house in ; not a stiff Clay, which wou'd not easily be wrought into ; nor one too light, and Sandy, which wou'd be apt to fall in : also a deep soile they love, that the water may not soak thorough, and trouble them.

In such an earth they dig holes, to breed in ; sometimes three, and sometimes three foot and a halfe deep, and a foot square within : into these holes they carry fine, and dry Grass, and cover that over with Wax, no otherwise then *swallows* coat their *Nests* with Clay ; but these *Bees* make their *Nests* *Transparent*, and full of holes ; and do coat them over, very neatly, with coverings made of Wax ; that they may be safe from Rain ; which might otherwise soake through the Earth and get into them.

In this Nest they make a *Theca*, or small *Cell*, like the halfe of an Egg, and the bigness of a Pea, divided in 2. parts.

Every *Bee* lays 9. little *Worms* in this *Theca*, or *Cell*, of the bigness of a Mustard seed, but as white as milke, and *Pellucid*. Then they shut up this *Theca*, that it may
be

be like a compleat Egg : This *Cell* now to the Sense is moderately hot, as an Egg sat on by a Hen.

I Observed the lesser Bees often to creep over, and about this *Theca*, or *Cell*; as though they had a mind to keep it warme, and so hatch it; and again I saw them scratch it, as though they wou'd make a crack or opening init; but they made it softer by scratching it.

The *Worms* included in this Egg-like *Cell*, daily grew bigger and bigger; in the mean time the lesser Bees did not cease their indeavours to hatch it, nor did they leave it off, untill it was broke asunder; also the *Worms* within by the continuall agitation and motion of themselves, did help forwards, this work of breaking it open; and they growing; the heat also increased, which made the Wax yet more soft.

The *Worms* hatched from this Egg or *Theca* lay quiet a whole Day, and then the great or *Old Bee* coming, devoured all the Wax, of which the *Theca* was made, and in which these *Worms* were included; that this Wax being again liquified in her body, might serve, as the material, of another *Theca*.

Now when these *Worms* (thus hatched out of the first *Theca*) have layn a whole Day, quiet without moving at all, and like dead things, they weave each for himself an Egg, of the bigness of a *Bay-berry*, of a certain spittle, destilling from their mouth, and body.

And being now made, they are indeed, moist and soft; but in time they dry and become hard.

These Eggs are all glued together in a *Bunch* by these *Worms*; and out of each Egg comes a *Bee*, as is *Figured* in the *Table*; where the Eggs or *Folliculi* is opened at one end, that the *Bee* may be seen, which comes of the *Worme*, *Figured* also in the *Table*.

This done the Great *Bee* comes again, and makes a new Egg; and puts therein 5 *Worms* of her own laying, and then a nother *Bee* do's the like, and 3d *Bee*, and so the rest follow,

follow, doing in like manner; untill all the work be finished and made like a bunch of *Grapes*, in forme and Figure.

And yet whether one and the same *Bee* perfect this work, and lay *Wormes* in all the *Theca's*, or Cells of the *Bunch*; or whether they are divers, and many *Bees*, at this work, making, and filling the *Theca's*, with *Worms*, we are not certain; but we judge it likely, that one and the same *Bee* requires the making of the whole bunch of *Theca's*; and fills them with her *Worms* only, for with these Eyes we have seen one *Bee*, which alone layed 33. *Worms*, and put them into the *Theca's*. This is also Observabe, every *Bee* in the making of every Egg, is busied, before that be finished, for 28 hours in a continued labour almost, yet some get their work done sooner, others later a little, as it is with Workmen, which are more handy some then others.

The *Worm* Figured in the Table, changed, the 11th. of July, and so continued, untill the 17th. of August, when it appeared in forme of the *Bee*, Figured in the Table.

when these Young *Bees* have, by biteing, opened the *Wax cases*, and are come forth of them, they are wont to rub their Eyes, with their foremost feet, and by this means of rubbing, they seem to open their Eyes, or at least to rouse themselves from sleep; in the fore part of their body, they are *White*, *Telowish* also, and *Black*, their wings ly upon their backs, and are not yet expanded, and they are moist; but are soon dry, by the Air; that in a quarter of an hour, they can expand, and extend them.

These little *Bees*, new hatched, are not yet fit for worke; but yet they covet to get up into the open air; but are a hinderance to the greater *Bees*, which are busily employed, who therefore drive them down, as often as they come up; also they run too and fro, as though they were drunk, after three Days that they have been hatched, then they are able to carry Earth, to the nests, which the old *Bees* Arch over, with Earth heaped together, which *Hollow Arch*, they draw over with a coat of *Wax*, as

Brick-layers Servants carry Morter, and Bricks with which they build Walls: In like manner, these *Young Bees* serve the Old ones; but they do not carry Earth forwards; but like *Hens* scratch it backwards, and those *Young Bees* which were first hatched and are elder then the rest, are imployed about the more master-like works; for they make Wax, dig holes, and Arch them; the Younger geting Earth; The elder eat Wax and soften it in their stomachs, and throw it up againe, by little and little *Liquidified*; and of this *Liquid Wax* and Earth mixed together, they make *Nests*; not unlike *Swallows*, and finish their work with their fore Feet complicated, and the Younger help them in bringing and ramming the Earth.

This *commonality* also has its *Kings* or *Captaine* as the Noble *Bees*, by whom they are governed, and this *Bombylus* or *Master Bee* is very old, and in body *Greater*, then the rest, like as the *King* of the little *Bees* do's excell the rest in magnitude, and shew: But this is destitute of Wings and Hair, where the rest abound, with *White*, *yellow*, and *Black* Hair, and are rough; this is altogether Bald, like naked Birds, or as is painted on the back part of the Head; moreover he is Black and shining, as Polisht *Ebony*; sometimes he comes to look upon the Works in which the *Commonality* is busied, and to explore whether they are made of a just measure, as well *Latitude*, as *Altitude*, conveniently creeping into the Nest, and creeping out; Ascending, and Descending, he do's seem, to measure as *Architects* are wont to take an exact account of the work, which the Work-men make; the *lesse Bees* when they meet this *Old Bee*, do not exhibit a little honour to him, as to the *King*; they do run about him every way; they stroke him once and again; in the mean time playing with their wings expanded, embracing him with the *Anterior* feet, as with armes, even as we gratulate him we meet, therefore the

the *Bees* are an example to us, of giving honour to old men.

When this *Captain Bombylius* has explored whether the work answeres the Rule; he doth descend into the *Latibulum*, and every one of the younger does anew set upon each his work.

In the Morning these come late to the work, and unless these little creatures, which daily in the morning creep upon them and about them, did not excite them, they would come later.

They have also amongst them another *Bombilius*, who like the *Drummer*, do's beat to the Souldiers, to come to the Gardes, or to move the Camp, or to March, or to Fight with the sound of the Drum, so also do's he excite them to work.

This about 7 a Clock ith morning, do's ascend to the top of the work, to be built, and with the halfe of his body, looking out of the hole, doth vibrate and agitate his wings, and by the benefit of them, doth excite a streperous noise in the hollow *Latibulum*, not unlike the noise of a Drum, which mostly is heard a whole quarter of an hour.

I, an expert person, and an Ear witnesse, do commemorate these things; Yea and an Eye witnesse, and together with Me, many others have heard it more then once, the Vibrating and Streperous wings of that *Drummer* of the *Bombilin*: I say, Persons, which for the hearing of this curiosity have visited me.

Besides, and to these, there is one that doth *Watch*, for when sometimes I did beat the nest, this Forth with did ascend out of the *Latibulum*, as one struck and astonished, and did *Discurre* every where, as one that did explore what matter was without: but suboderating noe danger, again he soon descended. More then once I have with admiration seen that. Sometimes also, I have put upon the stick, a *Domestick Bee*; but having spyed this,

forthwith out he came, and snatcht the *Bee* as one in wroth, and left it nor, till it was killed.

Furthermore I have found these *Bombilii*, to coat with Wax the Cells, out of which their fellow *Bees* had gone, to fill them with honey; to seal them up with Wax, lest the Thieves entering into them, should waste the Honey. For amongst these are to be found idle Drones, Thieves and slow *Bombilii*: Yet we have seen those, with the rest going abroad to collect Honey, did make a shew to fly out with them, but they did not goe out of the Chamber, in which I did keep them; but did only fly a few rounds, and that being done they did returne into one of the Glass bottles: (For I had placed two in the Chamber) in the which they had built their Combs: And each one returned into the Bottle out of which they came forth; when the rest flew out into the Fields, and Meddows, and afterwards did returne home, some loden with Honey, others with Wax, and some with Water, these Drones did returne empty into the Hives: and moreover did devour the Combs made by others, and the Honey gathered for winter.

These are the idle Cattle which do not imploy themselves in the gathering of Honey; but do consume the aliments gotten together, by their fellows, concerning which the *Ancients*. have said much, &c.

Perhaps you will aske what was the end of this Old *Bombylius*, which I did think to be the *King* or *Captain*: Him I saw near dying early in the morning before the Drummer did Vibrate, as he was wont, his wings, and did excite a noise to them, creeping out of the House: But wholly horrid and Trembling in body; hither come, as it were tired; he lay down and without Convulsion of the feet, sweetly did expire; neither did that seem a wonder to me, for his feet were long since numbed with Old age.

The *King* being dead, the number of the other *Bomby-*
lii.

li, did daily decrease, at last I did see a *Bombylius* creeping out of the Cmbs, whose Head was pluckt from the shoulders : A body without a name.

I beheld this Trunk palpitating, and lying alive two Days, and then expiring, hence it was easie to guesse, all things within to be troubled and done inordinatly and ill, and the *Bombylii* to doe as they list, and to fight fiercely the *King* being dead ; for from that time the *Drummer* beat not any more, as he was wont, the *King* being alive.

It is also worth admiration, about the birth of these *Bombylii* from one Old *Bee* of this kind, when he do's compose himself to propagate his *Specis*, Sometimes to come a *Hundred* and *Twenty Worms*, yet sometimes fewer, and sometimes more ; but one only sometimes, to have bred at once, there are many Eye witnesses besides my self, who have wondered, one of these little *Bees* to be so fruitfull, as to be able to constitute a *Bee Kingdom*, and an *intire swarme*.

Section. 6. of Beetles.

Number. 106.

Betwixt the bark and the body of an *Oak*, growing in the Island *Wallacia* in our *Zeland*, I found this *Worm* boaring it ; though soft, knew how by the benefit of a peculiar organ, as with a wimble to perforate a very hard wood ; and this kind of *Worms* use their mouth, out of which a sharp and hard Instrument doth stick for a *Wimble*. Also they are not a little strong, in protracting the hinder part of the body to the head wards : Moreover

they do affix the *Podex* in the excrements, and so they are placed betwixt the Wood and excrements, as it were squeezed in a Press; so that they may force with their mouth and boar, and in this posture they do perforate the *Oke*, and do live of the marrow and fattish matter, which they boare out. Being fed to satiety, they do extend themselves straight, when the Venicle has done its office, they do exonerate the belly, and at the same time they do, by little and little, more and more contract the body, and draw it up, as much as may be; so that always the voided excrement is found very close to the body: And so pressed they force into the wood.

This did give it self to *Transmutation*, the 28th. of *October*, placed upon the bark of the *Oak*, on which I had found it sitting, together with many other little ones; yet I judging it alive (for I saw them wag frequently) the Year following the 13th. of *January*, it did produce an odd *Animall*, of a Hoairy colour, variegated with black spots; but yet stout and fierce; in the Forehead, it was Armed with Horns, which it did draw back, when it was angry or did move forwards; but did joyn them, when pleased; did not suffer it self to be in it closed in a wooden box, for it did throughly bite into the wood, and that quickly, and so broke out, and so did shew from what kind it sprang; for I cou'd not explore of what aliment it did live, and therefore cou'd not keep it alive, but I suffered it to starve.

G. P. I.
Tab. 66.

Number. 107. b.

The *Worms* of Table. 107. b. are most bitter enemies of *Catterpillars*: The fore part of the body has two open claws; which shut and open like Pincers; by these claws they pinch the bellies of *Catterpillars*, and hang upon them

them ; the *Catterpillars* feeling the pain of the wound, do move and agitate the body every way, that they may free themselves : In the mean time the *Worm*, like one dead, the body being extended, doth quiesce without motion, and by how much more the *Catterpillar* doth move, and tosse ; by so much more is it hurt, and the belly is burst ; after that the *Worm* has let go, the wound doth forthwith swell, which seems to indicate a venome.

This *Worm*, well armed by nature, is Yellow ; and of a splendid colour : it cannot easily be hurt of the *Catterpillars* ; it cannot live above ground above two Days.

I put upon the ground one of the *Worms* described almost dead ; which forth with recovering spirit, penetrated by boaring the ground.

In winter time digging, I found one of these *Worms*, the Ground being Frozen, above two foot deep, (they easily abide cold,) together with a certain Bee, which I placed near the *Worm*, that I might observe how they agreed.

The *Worm*, forthwith set upon the *Bee*, and took hold of his head with his Pincers, and so long agitated, untill the *Bee* very much tired, did endeavour to get away ; but his wings being frozen, could not.

A little battle I saw at the same time betwixt a *Bee* and a *Catterpillar* ; which I had then also dug out of the Ground.

Number. 107. a.

G. P. 2.
Tab. 19.

The two *Worms* exprest in the *Table*, are plainly of the same nature, and cast upon the fire, do conflagrate like Oyle.

Now I shall relate the Metamorphosis of them.

One

One of the Worms, when he lay still for Transformation, it was the 2d. of June, and he continued in that posture till the 24th. of September, in which posture he is expressed in the Table.

But that same day he brough^t forth an *Animall*, like to a *Chrysalis* : as that Worm had a pair of Pincers, so this *Animall* was in like manner armed with Pincers, very pernicious, for with them he pierces and breakes the Eggs of *Ants*, and *Gryllotalpæ* ; wherever he finds them : He is equally as malicious, as the Worm, from which he is *changed* : Also he fiercely fights with his like ; and especially after three Days hunger ; for then he fights most stoutly with his Princes, &c.

When you do cast him *Ants* or *Gryllotalpæ's* Egg ; forthwith he doth *Exuge* them boared through with his beake.

As this *Animall* is an enemy, to all *Insects*, and do's endeavour to devour them ; So also it ha's its enemies and indeed very *Infest* ; to wit, the *Gryllotalpæ* , for these every where near their nest, make covered Burrows in which they do wait in Ambush, and observe which they may devour. As these are wont to kill *Caterpillars*, so to them is returned, what they have given to others : Yea as these have treated the *Gryllotalpæ*, not yet excluded and hidden in the Eggs ; so also the adult *Gryllotalpæ*, do treat these, and prevaile over them.

These *Worms* are two years old, when they *change* ; neither do they *change* the *Hackle* : But when they *change* forme, then *Snake like* they put off the *Skin*, and grow *Whitish* ; and also on each side the beginning of the wings is then beheld to come forth, but the Head and Feet obte^ct^d with a certain thin membrane, or skin, which by little and little doth excre^sce with the Feet, and at length doth fall off.

And this membrane doth seem only given to them for the conservation of their members, when they are in the state of Transformation ; and now when these *Worms*

are plainly Transmuted as dead, yea void of all motion, they ly upon the ground fixed, and there appears no signe of life in them.

Number. 108.

G. P. 1.
Tab. 6.

The *Worm* represented in *Table 108*. Was bred from the sweet Root called *Skirrets*.

In the same Root in which it was bred, it composed it self for *change* the 9th. of *August*, and the 25th. of the same month came forth a *Black* creature depicted in the *Table*: it is of a slow gate, as the *Worm* from which it was bred, when this little beast was first seen, it was covered with a *Yeliowish* colour very pale; the *Fore-part* was *Reddish*, but afterwards it became exactly *Yellow*, and then of an *Amber* colour; and at length elegantly *Black*.

I kept him alive some Days with sweet juices.

Number. 109.

G. P. 3.
Tab. M.

This *Species* of *Teredo* is wont to be found while yet it is little, betwixt the *Bark*, and the *Okewood*, or also in the very *Bark*; and there it is procreated of *Seed*; but now having got more strength, it do's boar into entire *Trees*; by its most sharp mouth, and doth inferre great damage to them: it doth seem a wonder, or at least worth the *Observation*, a *worm* so soft, little, and tender, to penetrate so great and most hard trees, and boaring the trees do's follow after the fat, and oleaginous juice with which it is Nourished.

It is necessary that the Anterior parts of the Mouth, to be not only hard, but also subtle, and sharp; by which they may penetrate to the intimate parts of the

Trees, and to *comminute* their substance, although wood, and most hard, into a most fine Powder; which in every *Species* of *Teredo* may be observed.

It compos'd it self to *change* the 10th. of November, 1663. And the 6th. of *Aprill*, the Year following 1664. the Red creature presented it self to our Eyes designed in this *Table*.

I kept it alive with Sugar untill the 5th. of *May*.

G. P. I.
Tab., 79.

Number. 110.

The *Worm*, of the 110th. *Table*, was brought in a certaine Ship from *New Zeland*, in the *West Indies*, into this Country.

I found it in the bark of wood, of which Chests are wont to be made, in which is wont to be brought Sugar, out of the *Indies*; from that bark it hath its *Originall*, and doth seek nourishment; it began to undergoe the *change* the, 7th. of *September*, and remained in it to the 19th. of *October*, and at that time *changed* the skin; and with the skin the shape; by little and little, the colour, members and all the rest.

The manner of the *change* (as I Observed it) I have set forth in the *Table*, and at length, the Transformation being compleated, an *Insect*, (perhaps never seen in these *Regions*) came forth, of a wonderfull structure and shape, much unlike to the first which it had; which I have also delineated exactly.

G. P. I.
Tab., 78.

Number. 111.

The *Worm*, of the 111th. *Table*, is in *Dutch* called the *Corne Worme*; because it consumes the roots of *Corne*; it is found also in Gardens and Orchards.

I took this *Worm* the 22^d. of *August*, 1659. And I kept it a whole Year in a Glasse bottle, with Earth put in the bottome: To which I injected the seed of *Henbite*, with a *White flower*. (for there is another Herb of that name with *Purple flowers*) and I observed in the evening the *Worm* to be wont to come forth, up from the bottom of the Bottle, that it might feed upon the Herb, and Flower, before described; this being done, again it hid it self within the Earth; for never or very seldom, it do's appear, in the Day time, above ground.

After the *Wormes* of this kind have eaten enough, and have come to the just Magnitude of body, they seek high places; that they may safely quiesce, and that they may pleasingly compose themselves to Transformation, which they expect.

This *Worm* seems to come from the seed of those *Bee-les*, which eat the leaves of trees, and which is very frequent in *Holland* upon the tops of Trees in *May*, for then their nourishment every where abounds.

This kind is wont to stay above ground two whole Months, or a little more, the rest of the Months of the Year, it lyes hid under ground and useth no nourishment; like to a dead thing, and it do's always, unmoved, plainly quiesce; but touched with a hot hand, or otherwise, it forthwith stirs; as I have often tried. And this also of this kind of *Beetle*, never to be found two or more joyned under ground; but alwayes *Solitary*.

Before the *Worms* hitherto described, were transformed into *Beetles*, they had lived over the forth Year.

The *Worm* of this *Table*, did begin to change it's forme on the 3^d. of *September*, 1658. and I have described the manner of it's Transmutation; and in *May*, 1659. from that came a *Beetle* depicted also.

It lives long, provided it be not starved; for want of food; or through the vehemence of the cold.

Number. 112.

G. P. 2.

Tab. 18.

This Kind of *Worm*, I found creeping upon *Green-corne*; and in vaine have sought it other where: They are pernicious creatures, for they eat the green Ears or Sheathings of Wheat: They swiftly ascend, and descend, as soon as they perceive the Corn to be touched with a Stick or the Hand, (The like is above noted of an *Eruca*) forthwith they cast themselves upon the ground, be they little or greater; the lesse swiftilier, then the greater; for that these are not so Tenacious of the Corne as those, which are Armed in the hinder parts with *Clippers*, by the help of which, they hold hard upon the Corne; being fallen upon the ground they creep into it, and ly hid under it.

One of these, affixed to a stalke of wheat, being about to change into a new forme, the 22^d. of *July*, as is depicted. On the 8th. of *August*, came forth an *Animall* very thirsty, for as soon, as it came forth, it drunk much, and often.

I learnt by experience, (and all that I have writ I have proved so) this *Animall* may very long be kept alive with water; and Sugar; but destitute of water; it lives not above four or five Days.

G. P. 2.

Tab. 15.

Number. 113.

These *Animalls* for the Elegancy of them, are called *Lady-clocks*; they owe their Originall to the Seed which their Parents shed and put upon the *Curran-bush leaves*; and which the heat of the Sun hatches.

These *Eggs* like seeds layd close in a round, as loaves in an *Oven*, the 20^{of} *May*, first did look black; But the 29th.

29th. of *May*, did grow greenish at the bottome; and the Second of *June*, every one of these Eggs, had a black spot, or point in the middle; and the 5th. of the same month, *Animalls* were hatched out of these Eggs; partly yellowish, and partly black; in which no touch of life did appear, unlesse breathed on, then they moved, or rolled, to and fro.

But the 6th. of *June*, when now their feet are grown, and hardened with the benefit of the aire, they creep about; then run about; but about evening, and when the aire was cooler, they run together, and kept close; either for company, or for heating one another; and in this situation, and posture, they remained till 16th it^h Morning of the day following; then every one set out to seek food, and that, the dew which useth to fall upon the leaves from the skie, and endued with a peculiar force of Aliment, well knowne to those, and other Insects, for food; for they feed on it, &c. About the 13th. of *June*, these *Insects* did put off their skins, Serpent like; which being done, they are Yellowish and Blackish.

The Day after, viz. The 14th. or about it, they change forme another time, and colour, so as to grow Yellow and Reddish.

They begin the 3^d. change, two Dayes after the Second change, in that very posture, and with a Black and Red colour.

The 4th. *Transmutation* they are wont to undergoe, the 3^d. Day after the 3^d. *Metamorphosis*.

And this is the last change which they suffer, and by it they get their last skin, partly Black and Red, and where it is Red, variegated with Black spots, or points, as is depicted.

Tis worth the noting, as often at they cast their skin, they fix their feet fast to the Leafe or Paper, they chance to be on, and when they have fixt them, they creep out

of the skin, and leave it standing so, that seeing of it, you would say it was verily one of those Animalls standing,
Ec.

I sustained these Creatures for some time with dew, collected before Sun-rise from the *Curran-bush* leaves, untill I saw them to have attained to their full Magnitude, and perfection, nor to make any further *change*, and then I set them at liberty to provide for themselves.

G. P. 2.
 Tab. 41

Number. 114.

With this sort of *Worm*, *Skins* and all things made of skins, are much infestd.

This I found upon the Feathers of the dried body of a *Duck*, eating the fat and skin thereof, and perhaps they are bred of it, because they feed of it, as many *Insects* exist from that, with which they are nourished, as the *Philosophers* Write. They creep very swiftly, as soon as they perceive any thing, which may trouble them, they hide themselves forthwith under the Feathers, so that they may not easily be found.

This deserves Admiration, these Worms to cast 10 *skins*, before they *change*; and as oft to cleanse, as they cast their skins.

Their Excrement is like a slender Thred twisted, yet firmly compacted, a Span long, and which may be extended, for it is *Viscons*, and hard to break, and under dirt, they are wont to ly hid.

I tryed this Worm to have fed, from the 10th. of *June*, to the first of *September*, when it did desist from eating, it began its Transmutation, as is depicted *Number 114.* and the 20th. of *October*, to have bred first a Hair coloured *Animall*; which then put on a Red, and lastly a Black colour. which was Yellowish, in the middle of the body.

You may keep these Anmalls, as long as you please if
 you

you give them *Walnuts* to feed on; but take their food from them, and they live not above four days.

No Insects are so fearfull as these are, for let them have the least perceivance of any thing, that may hurt them, and they presently counterfeit themselves dead for fear of being killed; and indeed, it is so with all kind of *Animalls*, who naturally fly things hurtfull.

Another *Worm* of this kinde I fed, not unlike in colour to the other, *Figured* in the same *Table*.

Which the 3^d. of *September*, compos'd it self for change, in the *Figure* depicted, it remained in that state to the 20th. of *November*, on which day it bore *Twins* a Male out of the right, and a Fe-male out of the left side.

But you'll ask, how knew you to distinguish *Male* and *Fe-male*? I answer, both these within a quarter of an houre after their birth copulated; and shewed me which was *Male*, and which *Fe-male*.

The *Male* was longer, and slenderer, then the *Fe-male*; which was shorter and rounder, the one delighted in the others company exceedingly; but I let them go together at liberty into the *Fields*.

I was an eye witnesse of this secret of Nature, from one and the same *Species*, two specifically different *Animalls* to have been bred, from the one, One; and from the other two a *Male* and a *Fe-male*; I saw this Transmutation with my own Eyes, and coul'd not find the reason of it.

Number. 115.

G. P. 2.
Tab. 10.

I find by Accurate search, that about the middle of *June*, a Greasie and Fat substance doth drop out of, both the upper, and the under side of the leaves of *Moth-mullen*. Sometimes sooner, sometimes later; but the 15th. of *June*, I found out this thing.

This

This fat juice did become a living *Animall*, the 20th. of *June*, to wit, a little *Worme*; which was in the middle of the Body pellucid, like water; was of a *Saphire* colour, Greenish, which slowly and gently was agitated by the Suns heate; but the 24th. of *June*, it became of a Yellowish colour, and the 27th. of the *same Month*; I did distinctly see on the hinder part of the Body, which was Yellowish, 32 Black spots, and forwards on the body 8 more.

These *Animalls* feed of the down onely growing on the leaves of *Mullen*; and this wool, or down mixed with *Venice Turpentine*, and used by way of suffumigation in smoke, cures the *Piles*; which I have tryed.

This little *Animall* did give it self to *change*, the 30th. of *June*, the same Year; but because nothing particularly came from it, I have not depicted the forme of the Sheath, or *Chrysalis*; for only after it had given it self to rest, it grew in its roundnesse, as though it would *change*, and the 8th. of *August*, it did creep out of its skin, as out of its Shell, Yellowish distinguished with Black spots, and round in *Figure*.

It is worth observing, that these Creatures, when they first grow Yellow, ever before they have feet, are besieged by their enemies; and they are certain little *Spiders*; which are of the same colour with them, and bigness; and without doubt, deceive them, upon the likeness of them.

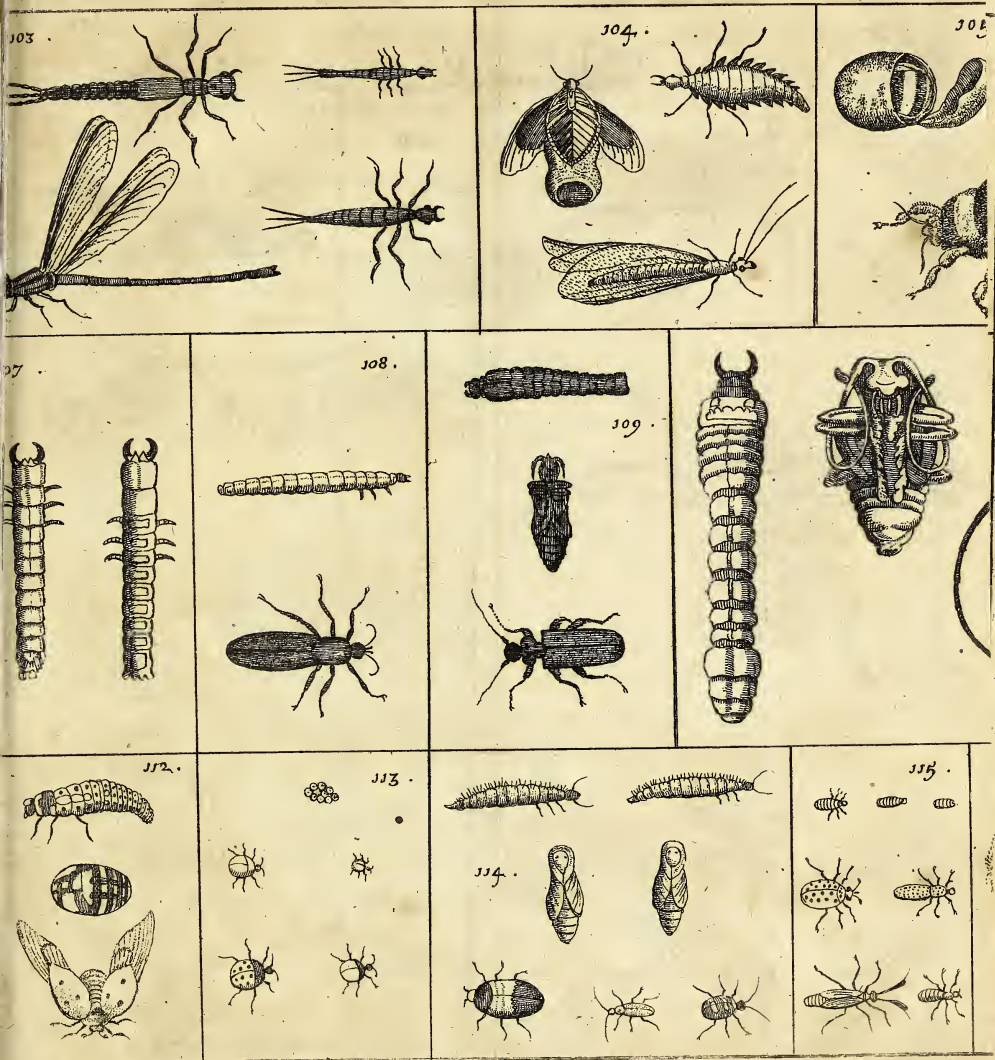
These *spiders* are bred of the same Leaf with them.

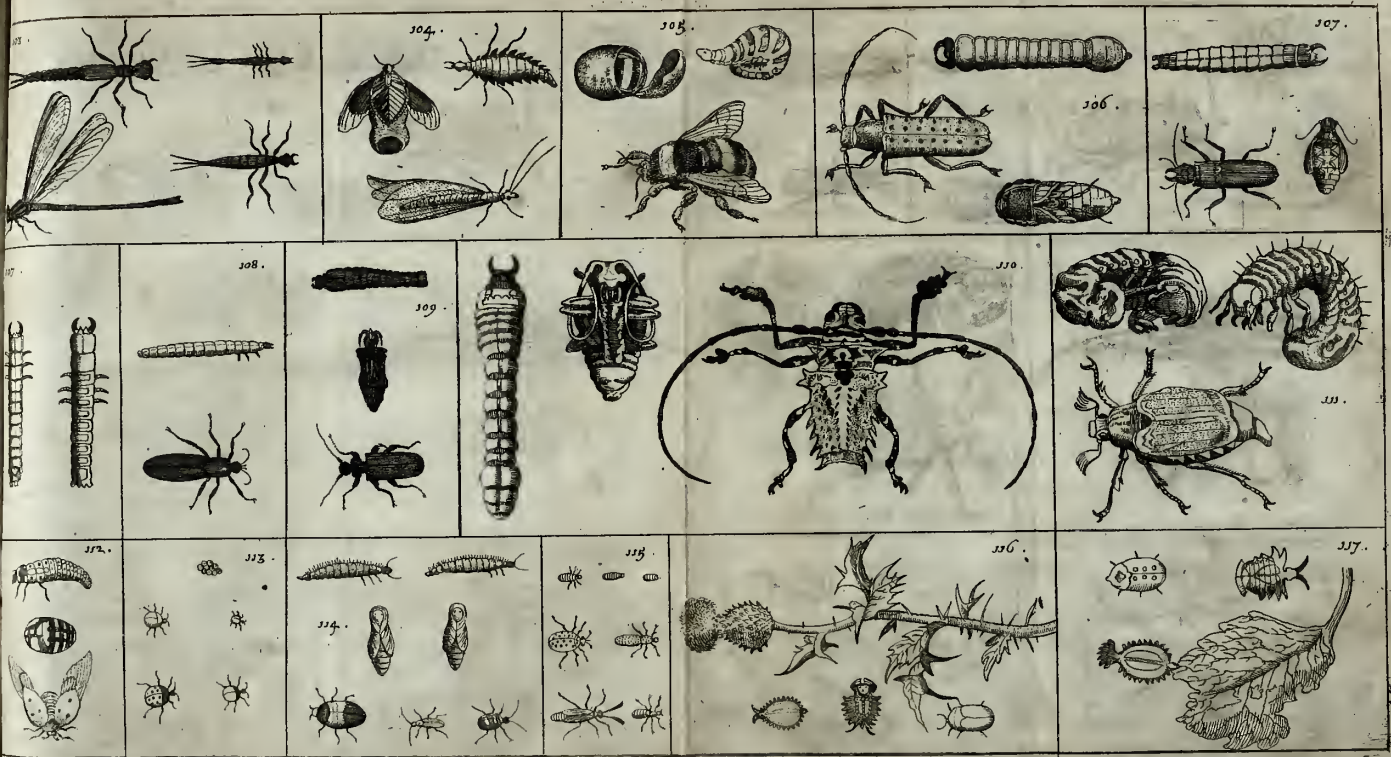
Moreover there is another Creature of a Black colour with Pincers in his Forehead, which he opens and shuts, as he lists; with which he kills these *Worms*, and *Spiders*: This also I guess is bred from the same Leaf, &c.

All of them feed of the Down growing upon *Mullen*.

This Down is pellucid like *Chrysalis*.

Number.







Number. 116.

G. P. I.
Tab. 43.

This little *Animall* feeds on a *Thistle*.

Hee began to be Transformed the 9th. of *July*: The manner of the *change* is depicted, for its singular elegance; The upper part represents the *Figure* of an *Imperiall Crown*, under which the *Image* of a humane Face offers it selfe: In the middle you have the *Image* of some ensign.

The state of that Transformation continued in this manner 12. Days; after that appeared a great *Animall*, having six Feet; which also I painted.

Number. 117.

G. P. I.
Tab. 44.

This *Worm* is not much unlike the former; *Melissa* Yields it aliment; whose juice drunk with Wine, is believed, to mitigate the pain of the Stone.

In creeping appears, near the extream parts of the Body, a thin skin; which do's seem to refrigerate it by continually fanning it.

It began to *change* the 7th. of *June*, and after 10 Days it received the forme of the *Insect*, depicted.

Number. 118.

G. P. I.
Tab. 45.

The *Worms* depicted in the 118 *Table*, I found upon the leaves of the *Willow*, in a certaine order; as it were, disposed in *Battle Aray*, and with the bodies erected.

And when they had come to their just Magnitude, their bodies being inclined, they began to eat, and to

abrade the tender particles of the leaves, soe that nothing was remaining, besides a certain dried skin.

They appear Yellow in the beginning, afterwards they become black.

They composed themselves for *change*, the 7th. of June, and the 18th. day of the same moneth appeared the Animals depicted.

These *Animals* have a certain glew, near the Tail ; by which they do adhere to all things so Tenaciously, that they can scarce be shaken of.

G. P. II.
Tab. 76.

Number. 119.

For *Gryllotalpæ* or *Field crickets*, I know them by many experiments to be very rebusht, and of a firm life.

I cut off the head of one of them ; which after 2 dayes was wholly eaten by another *Field cricket* : onely 2 little Nerves being left, yet the head lived 12 hours after.

I hanged another *Field Cricket* by a string in the heat of the Sun, so that it became wholly Black : yet it died not, before the 7th. day.

They are very ingenious in building their nest : for that end, they do elect a certain *Glebe* of earth firm and Tenacious : and therein they make themselves a hole to go in and out at ; within they make a great cavities, in the which they depose more then 100. Sometime 150. eggs.

This being done : the hole of the ingresse they accurately shut up, and they strengthen the *Glebe* as much, as may be ; for that being broken, all the eggs perish, and are consumed of certain *Black Flies* ; which ly hid under ground ; therefore they are very anxious and solicitous of conserving ; and making firm this *Glebe* ; therefore they perpare for themselves a certain subteraneous Du-

its,

Thus, round about the *Glebe*, that they may go round about this *Glebe*, and preserve it : besides, about this *Glebe* they have other holes, and hiding places ; whither in time of necessity they may Fly.

Again, they know how to raise up their nests, by a wonderfull industrie, in a hot and dry season, that they may almost touch the superficies of the earth : that by so much the better and sooner, the eggs may be cherished with the heat of the Sun, and hatch ; on the contrary, the air enclining to cold and humiditie, they do sink lower into ground their nests.

I have observed also the *Field crickets* to have wings, but not to fly : but for ornament ; that with them they may cover, and preserve the very tender hinder part of the body.

In the *Island Wallachia* of *Zeland*, there are many *Field Crickets*, and they do much hurt to the young and tender corne, which they saw in two with their mouth and cut the roots.

The *Gardeners*, that they may remove them, put into the ground little pots, that the upper lips may be equall with the superficies of the ground, the *Field Crickets* falling into these cannot get out.

Or their nests are to be broken, and the eggs spoiled

Number. 120. a.

G. P. 2.
Tab. 42.

The Animall depicted in the 120th. Table, a. is ugly. Beetle-like, and mostly lyes hid underground ; it has no wings, it feeds of the leaves of *Anemone*, or the garden *Ranunculus*.

This I put into a Big Glasse, the 5th. of May, filled with new earth ; the 11th. of the same moneth it thrust it self, with the hinder part of the body into the earth ;

at first I did not observe that hole was by it, but taking it out, I made all plain again.

The next time I looked at it, I observed, that it had thrust its body again into the earth, and I took it out again; but the 3^d. time seeing it again in the hole, I let it alone, & did observe not-a-few Eggs; which it had layed in the hole, Yellowish Eggs, like grains of Sand, thick compacted, as in the *Table*, they are depicted. When this Animall had layed its seed, it was as little again, as it had been, just before; for it cou'd scarce draw its loaden and big body, and now it became more *Agill*, and eat more meat, and greedilier, then before: also in a night, the hinder part of the body was extreemly shrunk up, and shortned by the halfe; it slept at the least 12 hours daily, as oft as it awaked, it devoured its usuall food, which I gave it, greedily.

And the 2^d. of *June*, I found it again crept with the hinder part of the body into the earth, continually beating the earth therewith, that it might more easily lay its seed &c.

After this manner it placed its seed upon the earth the 2^d. time, in the same form as the first; but that being done, it lived not long after; for when the leaves of *Anemony* did wither, it died with hunger, without doubt.

From the seed of this Animall, which was first layed, many very little *Wormes* were hatched, not thicker, then horse-hairs: But the 21th. of *June*, they crept swiftly, and were as big as Mustard-seed, had six feet and 2 horns.

The greatest part of these *Worms* being numbred, I found them above *Two Thousand*: but I believe there were 3 *Thousand*.

The seed which it layed the Second time, the 29 of *June* produced also many *Worms*, just like the former; but not so many in number, to satisfie my curiosity, I took them up on my Pencil point, a little wetted, one by

by one, and put them into a glass, and thus I counted 906. but many I lost in the telling.

I took great pains to find out a gratefull food for these *Worms*; but to little purpose, I gave them honey, dead earth *Worms*, Ants Eggs, Sugar, Bread, divers green herbs; but I could not bring them up to a just bignesse with all these.

But by means of a *Microscope*, I Painted to the life one of them, in the form you see it in the *Table*.

This and others I kept alive, and found that yearly they *changed* colour, the 2d. year brownish, the 3d. year black.

And thus much for the female *Beetle* I shall observe something of the Male of this kind.

Number. 120. b.

G. P. 1.

Tab. 74.

I found the *Worm* expressed in this *Table*, b. under an *Iron-Pot*: it is fierce, and devours all other *Worms*, even those that are wont to eat *Catterpillars*: I put him (for the experiment sake,) with 4 other *Worms*, such as are wont to devour *Catterpillars*, into a *China-Cup*, he forthwith snatched one of them up with his *Pincers*, and sucked out all his Juice, and although the *Yellow Worms* did much Strive to get away; yet this kept fast hold, till he had killed them all.

Number. 120. c.

G. P. 1.

Tab. 17.

Also again I noted about the Female of this *Species* in the *Table*. c. that it was of a slow motion, and crept, and rested by turns. It is wont to live in the darke under

der-ground, and also above ground in obscure places.

It is nourished with *Worms* only that it finds, and devoures, it tears open the belly of the *Worm* it kills, and sucks the guts, and eats them, lifting up its head, and now and then setting its feet upon the body of the *Worm*: I have observed the guts of the Yellow *Worms*, which it had plucked out, to have the thicknes of the hair of a mans head, now when it is full, it sleeps 5 hours, without any motion; and drawing its head almost under its body, it lyes upon a side.

And because this *Beetle* is of a very slow motion, and lives not, but of other *Worms*, it has wings; these wings are as long as its body, and yet do not appear, or can be seen, unless it produce them; so accuratly are they rolled up and folded, and thus hid, are not dirtied, and marred by creeping underground.

Section. 7.

O F

GRASSHOPPERS.

G. P. 2.
Tab. 40.

Number. 121.

Many years I desired to konw, whence *Grasshoppers* were bred, and did use muc d ligence in the matter.

I have had 40. years experience, and do attest the *Grasshopper* depicted, in the 121 Table, yearly to be found, the moneths of *November*, and *Decmeber*. in our
Island

Island' of *Zeland*, about old *Lime-trees*, and to live for some time of a certain humour they suck from these trees.

For winter coming on, they all dye which come from this *Lime-tree*, and it seems proable, they must desert those Trees; because they afford them no longer nourishment.

Whilst they are *Worms*, they live of and in the wood of the *Lime-tree*; but when they become *Grashoppers*, they have need of other nourishment then the leaves and humour of these trees.

The *Worm* depicted lying in the state of *Transmutation*, is not easily found, unlesse when by the force of winds, the Trees are torn up by the roots, or when the wood is felled.

About that time this *Worm* light into my hands, having entered into the state of *Transmutation* and resting in it, so that I cannot exactly tell the very time of its entry into the *Transmutation*, for it had placed it self in the very interiour pith of the Tree, and I found it in the dissected wood the first *January*.

As soon as I had got it, I placed it in its own earth, in a warm place near the fire. And the 3^{1th}. of the same month it brought forth a *Grashopper*, which cast its skin first, and then *changed* its colour. For 14 dayes I gave it *Sugar*, *Apples* and *Pairs*; but these not being its meat, it dyed.

Section.

Section. 8.

O F.

F L Y E S.

G. P. I.
Tab. 53.

Number. 122.

The *Worm* of the 122 *Table*, was bred of the Putrid flesh of a certain Bird; which I kept under a glass, untill it did begin to be transformed, the 30 of *May*, and the 14th. of *June* it had the shape of a big Fly depicted.

When it first came forth of its worm, or egg, no wings did appear: but in the space of halfe an hour, it seemed bigger by halfe, and the wings were spread and smooth.

G. P. I.
Tab. 54.

Number. 123.

The *Worm* of the 123^d. *Table*, was bred of a *Flanders Pica*, dead, and corrupted.

Having sought a Place to hide it self in, after the manner of Insects, which *change*; it began its *change* the 12 of *June*; and, the 27 of the same month, it put on the forme of a *Fly*, depicted,

Number

Number. 124.

G. P. 1.

The *Worm* of the 124. Table. had its originall from Tab. 55. the corrupted brain of the *Water-Hen*.

When the time of Transformation comes, it boars a hole in some wood, and hides it self in it.

It boared open all the wooden boxes in which I endeavoured to keep it ; so that I was forst to keep it in a glafs.

It began to *change* the 12th. of *August*: and it had the form of a *Fly*, the 26th. of the same month, depicted.

Number. 125.

G. P. 1.

Tab. 69.

The *Worm* of the 125th. Table, had its originall from *Wheat-bran* putrefied ; which I kept mixt with water, till it grew sower, and began to putrefie.

From this Putrefaction came many *Little Wormes* ; which begun to take a new forme, altogether the 22d. day of *June*: and the 2d. of *July* in the same year, they all *changed* into *Flyes* ; which lived without any food, till the 16th. of the same moneth.

The following Flys make a distinct Genus, remarkable for their Quick and Steddie flight.

Number. 126.

G. P. 1.

Tab. 2.

The *worm* of the 126th. Table: is bred in *fakes*, Privies, or *sincks* ; its *Long Taile* serves, that it rolls not in creeping,

ing, for that it has a round body without Legs; as it rolls it ballances it self with its taile.

It composed it self for *change* the 26th. of August, for which end, these *Worms* seek hiding places in the chinks, and clefts of old walls.

It remained in its *change* 17th. days, depicted in the *Table*, then came forth a *Bee*.

When this *Bee* was first hatched, I thought it wanted wings; for in the place of them, I cou'd Animadvert nothing; but 2 white points like *Pin-heads*; but the *Bee* forthwith began to spread those white spots, with its hinder feet; and within 2 hours fitted them so, that they were fit to fly with.

The nourishment of this *Bee*, is a certain *sweet juice*; which it draws from the flowers of *Carduus Benedictus*. it also feeds on *Sugar*, and may be kept long alive with it.

It uses little *Aliment*, for it lived 21 days without any food:

By the Bee, is to be understood a Fly; that is, a Two-winged Insect; the Bee kind having ever Four wings.

G. P. I.
Tab. 4.

Number. 127.

The *Worm*, of the 127th. *Table*, is found in *Privies*; and is bred of *Mens Excrements*; it is a very slow creature.

It composed it self for *change* the 28th. of September: and remained therein to the 22d. of October.

And at that time was born a *Fly*, depicted in the *Table*.

These *Flyes* are wont to abide about the places where they are bred, and I cou'd not keep it alive with *Sugar*.

Number. 128.

G. P. I.
Tab. 4.

The *Worm* depicted in the 128th. Table, was bred of rotten dried Fish called *Scate*.

Nature cannot be idle; the corruption of one is the generation of another; and from rottenness, especially in a hot and moist matter (which seems to be most apt for generation,) divers Animalls are produced.

I experienced this *Worm* the 26th. of May; to be changed into an egg; and a *Great Fly* to be bred of that egg the 21st. of June, depicted in the Table.

Number 129.

G. P. I.
Tab. 50.

The *Worm* represented in the 129th. Table, is bred in the fruit of that *Shrub*, which in *Dutch* is called the *Speen appell*; and the virtues which are ascribed to the fruit; are also of the *White worm* bred within it, to wit, for the *Piles*, and *burning Fevours*, and for these ends, the fruit is gathered about the 16th. of October, for the little *White worm* remains therein, to the middle of June of the year following; and at that time is turned into a *Fly*, making a hole to get out at.

Number. 130.

G. P. I.
Tab. 51.

I had a mind to try, what wou'd become of the putrid and corrupted *Urine* of a man; I made a Funnell of paper, and so folded it, that no *Fly* or other *Animall* cou'd get into it: having infused into it oft times

humane *Urine* ; I found some *Worms* to be bred in the folds, where the feces stayed.

I reserved one of them, for the experiment sake, which composed it self for *change*, the first of *March* : and the 14th. of the same moneth, it had the forme of a *Fly*, depicted in the *Table* : its head *was Red*, the body Black, and the hinder-parts Yellowish.

G. P. 1.
Tab. 52.

Number. 131.

This *Worm* was bred of *Barley* flower ; which yet it did corrode into smaller particles : this flower being moist, putrefied, and this *Worm* was bred from the putrefaction ; for the corruption of one, is wont to be the generation of another.

I cou'd not observe this *Worm* to live ; but yet it began to be *changed* the 8th. of *August*, and 23^d. of the same month it received the form of an *Oblong fly*.

G. P. 1.
Tab. 73.

Number. 132.

The little *Worm* of the 132th. *Table*, was bred of *Rotten Cheese*, mixed with *Cummin* ; with which also it is nourished, and kept alive.

These *Worms* do not creep so much, as (the body being gathered up) they suddenly Spring, and Leap *Locust-wise*.

Before they do compose themselves for *change*, they do quiesce 3 days.

This *Worm* began to *change* the 28th. of *November*, 1658. and the 10th. of *May* the year following, a little *Fly* appeared, which lived 8 days without food.

The

The *Worm*, the *Chrysalis*, and the *Fly*, are all depicted in the *Table*.

Number. 133.

G. P. I.
Tab. 41.

The *Worm* of the 133^d. *Table*, is wont to be found upon the leaves of the *Curran-bush*, which are blasted: under those leaves I have descried to lie hid, a great Number of little *Animalls* like *Pediculi*, the *Worms* of this *Table* eat them.

For whilst these *Worms* do quiesce, without any manifest motion; and that the *Animalls* do creep about and upon them, they sting them with their beak, and eat them.

It began to change the 19th. of *June*, and the 30th. of the same Month it appeared under the forme of a *Fly*; and so in the space of a 11 Days a *Fly* is bred of a *Worm*.

Those Pediculi are very probably Cimices;

Number. 134.

G. P. I.
Tab. 47.

The *Worm* of the 134th. *Table*, feeds of little creatures, which they call *Green Lice*; and do lick the fat of *Roses*; so that it is very manifest, not the least *Animalls* are safe from enemies; but the *Lice* are food for the greater.

This *Worm* do's stick to things, and keeps it self immoveable by the bigger and obtuse parts of the *Body*; but the acute and slender part, which is like a *Proboscis*, it tosses every way, and moves it, that it may

take some of the Foreſaid little Creaturs, and having caught them, it liſts them up, leſt they ſhould ſtick or adhere to any thing, and ſucks them ſo liſted up, untill nothing remaine but a every thin Skin Wings and Feet. Alſo theſe Worms ſeem to love *Ants*; for they are often with them, but hurt them not.

It began to *Change* the 14th. of *July*, under the *Figure* of an *Egg*: and the 21^{ſt}, of the ſame Month, it received the forme of a very long *Fly*.

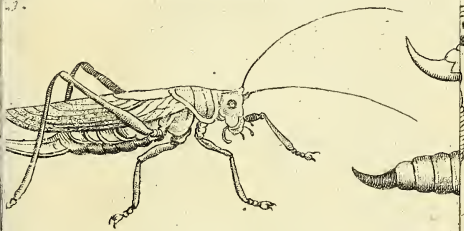
This was a By-birth, and an Ichneumon-Waſp; the true birth ſhould have been a Fly, like the laſt deſcribed.

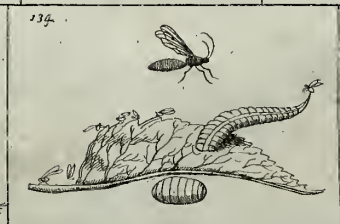
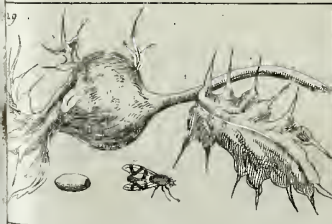
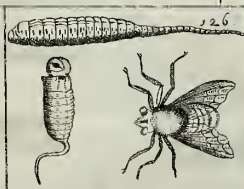
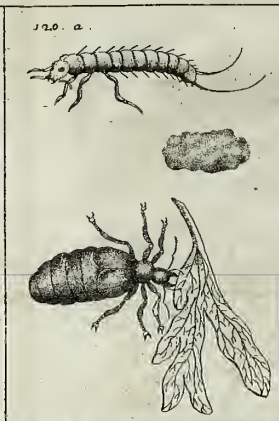
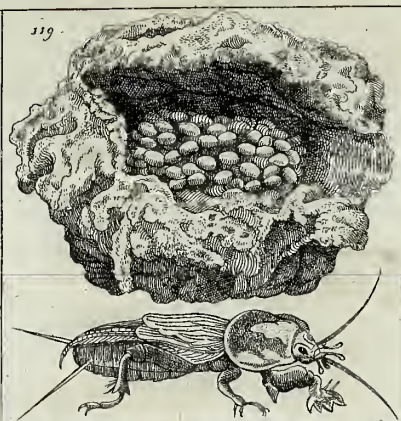
Number. 135.

G. P. 2.
Tab. 11.

There are many of theſe *Worms* to be found upon the leaves of the *Elder*; for they are bred of the *Seed* which the *Fly* their *Mother* layes upon them in the Month of *June*, and Hatched by the heat of the Sun.

They well know by inſtinct (which is admirable) that there will be food ready, as ſoon as their Young ones are Hatched, this inſtinct is *Analagous* to reaſon, and comes near it: So that there they lay their *Eggs*, where they know the little Brood, as ſoon as Hatched, will find meat; for the *Ants* do depoſe a ſertain fat and ſecund humour, upon the extreme boughs of the *Elder*, *Apple*, *Cherry Pare-tree*; and upon the leaves of the *Curran-buſh*, from which little Creaturs of a *Green*, and ſometimes of a *Black* colour, are bred; from the





the hinder part of whose Body, an humour is wont to distill, which these Creatures vehemently covert; as Fishes Water, and greedily sup up.

And when these Flyes know, that these little creatures are bred, a future meat for their Young ones; they do inject their Seed upon the leaves.

These little Creaturs have six Feet, and long Winges, yet I never found them to fly; but are a food to these *Worms*.

These *Worms* know how to Counterfeit dead, and to lie amongst them; for that the innocent little Creatures creep over the Bodies of the Worms; which when the Worms feel, they take them with their sharp bills, and suck them; lifting up their *Proboscis* like Hens, when they drinke.

These Worms feed of these little Creatures, and the Birds feed of the Flyes, they are *changed* into, and we of the Birds.

As soon as these little Creatures perceive the Worms, forthwith they fly them, and run away.

When this Worm has fed to its fullness for twenty four hours it is wont to rest and sleep; from Eight ith Morning till Nine the next Day, and when he again feels these little Creatures to run about him, he Eats as much of them as he has a mind, and now full again, it rests, and seems as Dead.

And the 12th. of *June*, this Worm affixed to a leaf did compose it self for *change*, as is Depicted.

But the 15th. of *July*, a *Fly* was Borne; which as soon as come forth, in halfe a quarter of an hour became as big again, and lived four Days without Food.

These Little Creatures are a numerous Brood of Cimices.

Number. 136.

G. P. 2.

Tab. 47.

The 30th. of *August*, I took up a *Ripe Mushrome*; and putting it under a *Glasse*, I exposed it upon the Pavement to the Sun. The Day following, that Little *Mushrome* was full of little Black Worms; but the 11th. of *September*, the greatest part of it was turned into Black water, like Ink; except that part, which was called the Stoole, or Foot, being the Root.

In this impure Water I numbred 63 worms; which the Day following did betake themselves to *change*; but 7 Days after the 10th. of *September*, they were all turned to *Living Flies*, very swift and nimble, with Red Heads, and Black Bodies; some of these were of an Elegant colour; and had on each side a little hammer, with which they did beat and excite themselves.

Some of these had Black heads; but one was of a different colour from the rest, and of a bigger bodie. &c.

You may keep these (if you please) long alive with a Sweet Liquor; I speak this by experience, as all things else; for I fed many of them from the 10th. of *September*, to the 24th. of *December* the year following; and I cou'd have easily kept them longer, if it had been to any purpose.

G. P. 2.

Tab. 22.

Number. 137.

We may very often see, upon the leaves of *Oziers*, and other Trees, certaine Little green creatures, and

so tender-skined, that they are crushed with the least touch, and the humour squeezed out of them is green.

These are bred from a certain humour, which the *Ants* lay upon the said leaves, and with the sun, hatches into little creatures: they spoil the boughs they are bred on; for they corrupt the wood, knitting upon it a net: under which lying-hid they grow up; and in the mean time do suck up all the moisture; so that the boughs being deprived of that humour which is owing to them, do become lean, tender, and black barked; not like the rest of the wood.

When they are new hatched, the *Ants* are seen to creep amongst them, and as it were to cleanse them.

The *Worm* depicted *Table 137th.* eats these little creatures, as soon, as they are grown up: yea it fills it self with these, that it can hardly stir; and being so filled, it rests quiet in the same place it laid it self down in, to the next morning; and then, when the yesterdayes meat is digested, it begins to devour the remaining creatures, or seeks a new bough, better furnished, and on which more of these small creatures sit, and of them it fills its hungry belly, as before.

This *Worm* gave it self to change the 10th of *June*, in that form and Posture as is depicted, and it remained in that state 20 dayes, so that the 29th. of *June*, a *Fly* came forth, which (wonderfull!) most suddenly came to its perfect bignesse; for within a quarter of an hour, it became as big again, as it was, when it was hatched, and as big again as the egg from which it broke out.

I knew not what to give it, that it wou'd tast, and so it dyed the 5th. of *August*.

G. P. 2.
Tab. 45.

Number. 138.

The *Worm* of the 138th Table, is mostly upon the leaves of Elder; for the most part it is on elegant whitish colour, and yellowish; which afterwards becomes blackish.

It feeds of the little creatures, which are often to be found on the extream twigs of the Elder: these are the offspring of *Ants*; bred of a humid seed, layed by the *Ants* upon the extream boughs of the Elder, and, by the heat of the Sun, cherished and brought to maturitie; that these little creatures might be bred of it. Also the *Ants* are continually at hand, to defend them against this *Worm*. &c:

It you wou'd know whence this *Worm* is bred, I answer that it is bred of such a Fly, as is depicted in the Table, which is wont to lay its seed upon the leaves of the Elder, well knowing these little creatures to be there, which may serve it for food, and from the seed of this Fly, this *Worm* cherished by the heat of the Sun, doth come.

When I had fed this for 13 dayes with its due food, it left eating, as though it wou'd have begun its *change*; but Two dayes after it put on the glorious colour before named; which done, it again devoured the little creatures; and last of all, the 26th June it did compose it self for *change*, and did remain in that state, to the 13 of July, on which day came forth a Fly, very like that of the 130th Table above, but a little bigger, and Yellow on the forepart, it lived fasting till the 17 of July.

Number. 139.

G. P. 2.
Tab. 44.

The *Worm* depicted in the 139th Table, is seldom found, for that it lyes in stony, and moist grounds; and sometimes it is in Gardens, for the gardeners complaine that this *Worm* doth hurt their herbes not a little; nor is it easily to be taken, for it knows how to hide it self under ground, as soon, as it feels any thing to stir.

It feeds on all sorts of herbs, and eats their roots, it is very voracious, so that filled it is twise as big, as when it is hungry.

It peeps out of the ground onely with the head; which it forthwith draws in again, as soon, as it doth perceive any noise; you must take it with a Spade.

Having taken it, I put it in a glasse, filled with earth, and did expose it to the open aire; in a place moderately hot of the Sun; and I provided it with meat and drink; In this glass it composed it self for *change*, in that posture in which it is Painted; the 29th of May: and the 25th of June following, it bred a creature furnished with 2 wings, and 6 long Feet called by us when boyes, the *Tayler*.

These *Tayler Flies* are very *Lecherous*; there are double Number of males, for one female; for this you will experience with me, if you mind as I have done often, when the male Couples with the female mostly 5 or 6 males Fly about them, each of which stay their course of coupling, and endeavour to hinder the former; To whom it is given first to couple, he remains affixt to her 2 dayes together; and the male, loose, not very long after dyes; but the female lives.

And when the *Seed* of the Female is ripe for laying, it infixes, its Taile in the ground, and layes its seed

in it; from which this mischeivous *Worm* is bred, which is not fit to breed *Tayler-flyes* till it be Three Year old: if it were not for this Three Years unfittesse to breed, and that there are more Males then Females; this *Worme* wou'd do great mischief, in which, God's providence is much to be admired.

These Flyes are those with very Long Legs, and which by our People are called Drummers. It is remarkable, that they lay Violet-coloured Eggs; all the Species of them, which I have yet seen, and have I seen at least Five sorts with us in England.

Of the Originall of G N A T S.

This is also a new Genus of Flyes

Number. 140.

G. P. 3.
Tab. 10.

I have sought with great diligence, what was the generation of *Gnats*, and from what principle &c.

I Observed *Gnats* to retire to *Cisterns* in great Numbers; and especially about the begining of December; thither they carry their Seed, and after the same manner, as I have often learnt by my own proper Experience; for they are wont to sit upon the surface of the Raine-watter, contained in *Cisterns*, the hinder part of the their Bodies being inclined down.

downwards ; and to excerne their Seed, and that Seed so dejected, doth forthwith sinck to the bottom and after a little time, is converted int Red, and (as it were) *Bloody little Insects.*

These *Little Bloody Worms* are nourished of certaine little Creatures swimming in the Water, which I have been wont to call Water Lice, because they have almost the same forme with the paper Lice, and they stay there 11 Months, and they do make themselves little Cells of their own juice, mixt with the particles of Lime, within which they hide themselves, against the extreame cold.

But the time of the Naturall *change* being at hand, they do convene in great numbers , and the heads of all being joyned, the hinder parts of their Bodies, are long much tossed , too and fro , and do excite a great motion of Water , with which motion, I have Observed a great plenty of a certain *Tenacious juice*, in which they compose themselves for undergoing a *change*.

The 30th of June, and 13th of July, I Observed many *Gnats* to flie out of the foresaid Juice : The Males have light Fethers on the Head, but not the Females ; but do swel with Eggs, nor yet can so vehemently prick our skins as the males.

As *Gnats* do arise from bloody little *Worms*, so they do vehemently desire Humane blood ; for that end they enter into our Houses about Night, even by the Chimneys, and other hidden places, if they find not the Doors and Windows open, then they thrust their Trunks, or Darts into the parts of the skin : Where they may find an open passage to the Blood ; which they suck and are mightily delighted in: They *Draw it* with very subtle and *sharp Darts*, made of as it were three small Hairs, contex-

contexed; but hollow within like Pipes, and adapted to draw blood upwards.

I have sometimes Observed, that a *Gnat* well filled with blood, not to recede from our Skin, untill a drop of Water, had been rejected out of her Bodie: Which I guesse to be the *Serum*; and in so short a time to be seperated from the Blood, and rejected as an excrement.

When the *Gnats*, new bred, do ascend from the bottom of *Cisterns*, they are *white*, and do seem to want Feet, and Wings; but these do appear in the space of a quarter of an houre, and they are wont so long to adhere to the sides and walls of the *Cisterns*; untill the wings are now enough expanded, are hard, and are fit for flight.

But some will Object, how I cou'd so accuratly Observe, what *Gnats* do in the bottom of *Cisterns*; to whom I Answer, I Observed all things in a Glass Vessel made for that end, into which I put all those things, which are wont to be found in *cisterns*, to wit Lime, little Stones, Earth and Rain Water, to which I put the above described Red *worms*. Also I was forced to place that Vessell in a cold place; also often to renew the Water, and to admit the fresh aire.

For experience taught me, those little *Worms*, for defect of Coolnesse and fresh and well tempered Aire, all soon to Die: Therefore by meanes of the pellucid Glasse, I Daily and diligently observed, what was Daily done in it, and what *changes* happened therein.

Section.

Section. 9.

OF
MILLEPEDS.

Number. 141.

G. P. 2.
Tab. 36.

All this History of the Authors is Founded upon a mistake; as thinking these July, or Millipeds (of all which He has given Us the Figured, Table 141.) were bred of the Thigh bone of a Man; when indeed, they were only lodged therein, in the depth of winter; the whole thing is impertinent and not worth the recital.

Number. 132.

G. P. 2.
Tab. 48.

Besides what I said of *Mushrooms* Number 136. I saw also when the aforesaid *Worms* were changed into *Flies*, and when I had placed the water, from whence they came, before the Sun; it was filled with exceeding little *Animalls*, which moved themselves, and were therefore alive; which after I had taken out of the water, by the help of a Pin, and had view-
ed

ed them in a *Microscope* ; I found them to be very little *Serpents*, or *Snakes*; and indeed, Multitudes of them did move so swiftly, and did mix themselves so together, that they cou'd not be counted.

I kept many of these two Years, and I found them marked in their Bodies ; some with *Black*, some with *Green*, and others with *Brown spots* ; but the greatest of them which I kept, was of the Size and shape, and variegated with *Brown spots*, as is delineated in this 142 *Table* : It was very swift and nimble, for as soon as I laid it down on the Ground, it crept into it, and I had lost it, if I had not presently dug it up, by the help of a little Spade, I had in my hand.

I kept this little *Snake* long in a Glass, filled with Earth and water ; but at length through the great heat, and want of Water, he died, which I was very sorry for having kept him so long.

Section

Section. 10.

O F
SPIDERS.

Number. 143.

G. P. 2.
Tab. 49.

In the before mentioned Matter, from whence the *Flyes* and *Snakes* come, I saw also and found a certain kind of *Chrystalls* ; like in forme to small Sands, but but there grew out Feet to them, and by degrees they grew greater ; till in three Years space, they were full grown, and attained the forme of the *Spider* Depicted in the 143 Table.

Of the *Mushrooms*, growing out of the Roots of the *Poplar Tree*, is wont to breed another kind of *Spider* ; of an oblong forme, a Yellow colour, and stinking.

From *Rotten Mushrooms*, another Race of *Spiders* do's proceed, and they are *Reddish*, there is another kind of *Mushroom*, which rises from the Earth, which first of all appears shut, but in a days time is open, and then it represents the forme of a *Mushroom*, with a round dish, or little house, like the cup out of which the *Oake Acorns* are taken ; in this Cup is found Five round grains of seed, of the size of *Raddish-seed*, but pellucid, as *Chrystall* ; after these grains fall out of the cup on to the superficies, or into the chinks of the earth ; they are cherished by the heat of the

fun, till they begin to live, after wards they get feet; and in three years time they attain to their full growth, all these things I tried twice Two years together.

These *Spiders* delight to be about the herbe *Balm*; and in Summer time they shaddow themselves under it; but in winter they ly hid in the Chinks of walls, or wooden fences.

The forementioned *Spider*, which has its originall of *Mushrooms*, (which many esteem a delicate) has long feet, which I have exhibited to you, in its birth, progression, encrease, and perfection, in this 143d. Table. where *Figure 1* represents it, at it's first appearance, *Figure 2* at the space of halfe a year : *Figure 3* at two years: *Figure 4* Three years growth; when it has attained its full size; which it keeps till it dye, by a natural or a violent death.

These *Spiders* are rarely found on the superficies of a smooth wall, but commonly in the fissures thereof; but so as they have their feet exerted out of the Wall, and in my opinion to this purpose; that if any humour come from the Wall, they may take it with their feet, for with this all their feet are embrewed, and they first move their fore-feet to their Mouths, and then the rest; which they successively brush thorough their Mouths, by the help of their *Forcipes*, and so lick off the *Nitrous humour*, sticking thereto, by which they live.

On the Day time these *Spiders* are wont to rest, unless you drive them away; but in the Night time they play together; for then they are often seen to take hold of one anothers feet, and so to fall upon the ground, and when they play thus together, they do not hurt themselves; for when they fall on the ground their long feet being streched out, they fall on them like *Cats*: As soon as they fall they presently rise again, and stradling with their Thighs, they ascend the

the Wall with a Stilt-like motion : They often also Fight so, that they kill one another ; for they are very tender, and are easily killed ; and this is well seen in them from an instinct of nature ; therefore with their legs contracted and affixed to both sides they sit, and defend themselves ; for then their bodies being defended on every side with their Feet, as Tennis with Pales, they sit safe, prevailing against the *Spiders*, that assault them, with their own strength ; in this posture one of them cannot kill another at one assault ; what do they then will you say ? The more strong entangle the Feet of the more weak with a wonderfull dexterity , and hold them so bound, like the small tendrells you see on vines, which wreath about and encircle the branches, and embrace them ; and then they hold their Feet so ensnared with theirs, and break them one after another ; nor do they cease, till they have pulled off foure or five of them, this being done, they leape upon them, and bite them, and suck the wound, and leave nothing, but an Exanguious skin, suckt dry, and the rest of the Feet.

One of this kind of *Spiders* I kept long, with Water of *Saltpeeter* and *Lime* mixt ; he was very fierce, he alwayes overcame all the *Spiders* I offered him, although he found some amongst them, which took him up much time, and gave him some danger of recovering his health, which he cou'd not overcome, but with much difficulty ; at length he remained Victor of all, viz. Thirty in number, which I gave him one after another.

I placed before him two Pots ; in the one I gave him Meat, in the other Drink ; but he put his Feet into one, and the dry Carcasses of the *Spiders* he had killed.

Having eaten these *Spiders*, he grew great, and put on a Black Colour ; at length he dyed, no doubt of the abundance of the juice, which he suckt from the *Spiders*, and their Flesh which he had eaten.

G P. I.
Tab. 70.

Number. 144.

The *Worm* of the 144th *Table*, is most worthy of admiration; which I took the Third Day of *Aprill* 1658. I never cou'd observe (though I was very diligent) whether it eat or drunk; neither cou'd I animadvert whether or noe it had any Eyes, or any aperture in its body; by which it might either receive nutriment, or eject excrement: it wants Feet; it always rests, immoveable, and rather rejoices in cold then heat; for I placed it in the Sun beams, and presently it sought for a skadow and shelter, and afterwards moved not.

Sometimes it turned its body, so that it lay on its back, but presently contracting its body into a round, it kept its former habit, as is *Figured* in this *Table*.

I had this *Worme* alive with me at home, from the third of *Aprill* 1658, to the 28th of *August* 1659, without any food, and on that Day it dyed, afterwards (which is worthy to be observed,) there lived always near this *Worm* three *White Animalls*, lesse then common *and*; which always stuck on the belly, or back of the *Worm*, and after this manner they lived Nine Months without any food that I observed, at length, two of these *Animalls* on the Head, and the third on the Back of the *Worm*, dyed.

F I N I S.

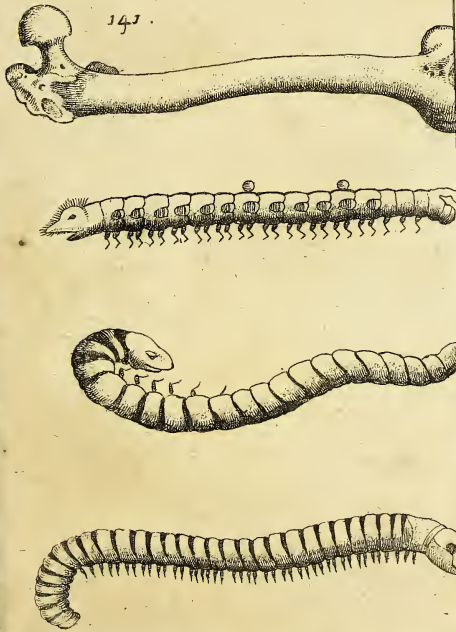
136.



140.



143.



144.

